AUGUST, 1952

The Review of Gastroenterology

OFFICIAL PUBLICATION

NATIONAL GASTROENTEROLOGICAL ASSOCIATION

Roentgenographic Diagnosis in Gastrointestinal Disease

The Indications for Vagotomy

Refractory Peptic Ulcer

•

Seventeenth Annual Convention

New York, N. Y., 20, 21, 22 October 1952

VOLUME 19 NUMBER 8

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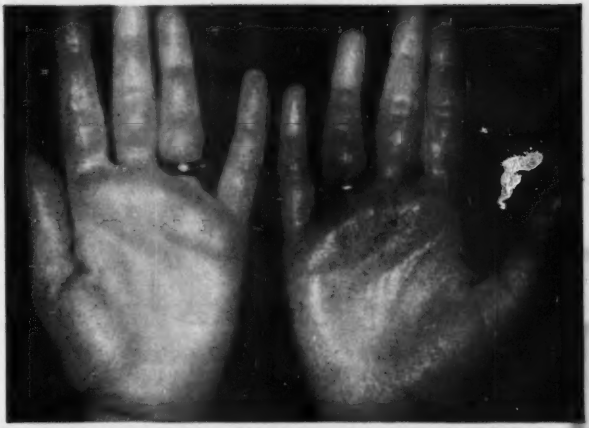

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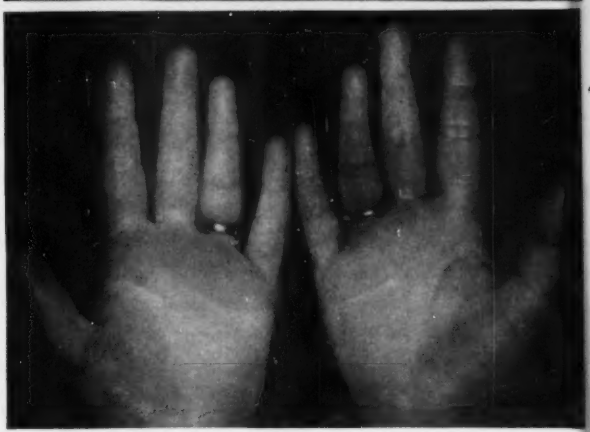

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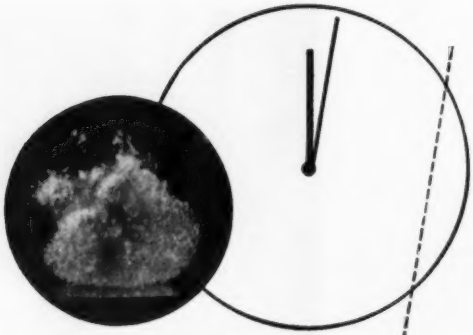

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(INCORPORATING THE AMERICAN JOURNAL OF GASTROENTEROLOGY)

The Pioneer Journal of Gastroenterology, Proctology and Allied Subjects in the United States and Canada

VOLUME 19 AUGUST, 1952 NUMBER 8

CONTENTS

Owned and published monthly by the National Gastroenterological Association, Inc. Business Office: 1819 Broadway, New York 23, N. Y. Editorial Office: 146 Central Park West, New York 23, N. Y. Subscription rate, U. S. Pan-American Union: One year $5.00, two years $9.00 (foreign $7.00, $13.00). Single copy: $.50. *Reentered as second class matter, February 24, 1947, at the Post Office at New York, N. Y., under the act of March 3, 1879.*

Index to Advertisers

The Review of Gastroenterology

OFFICIAL PUBLICATION

of the

NATIONAL GASTROENTEROLOGICAL ASSOCIATION

1819 Broadway, New York 23, N. Y.

Editorial Office, 146 Central Park West, New York 23, N. Y.

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Communications regarding business matters, advertising, subscriptions and reprints should be sent to the Business office, 1819 Broadway, New York 23, N. Y.

Subscription price: U.S. and Pan-American Postal Union: one year, $5.00, two years, $9.00. Elsewhere, $7.00, $13.00. Single copy $.50. Members of the National Gastroenterological Association receive the REVIEW as part of their membership.

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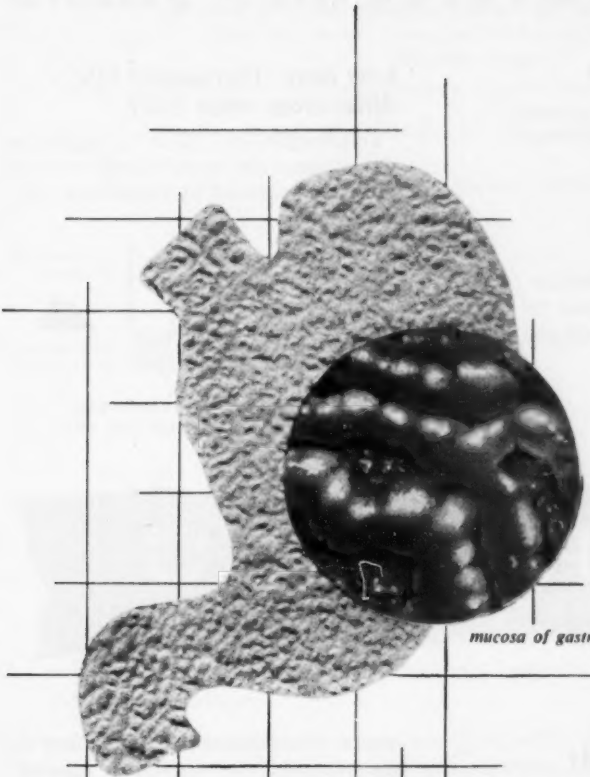

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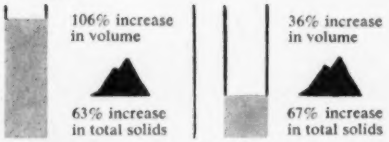

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The Review of Gastroenterology

A monthly journal of Gastroenterology, Proctology and Allied Subjects
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VOLUME 19 AUGUST, 1952 NUMBER 8

REFRACTORY PEPTIC ULCER*

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Chicago, Ill.
ERWIN LEVIN, M.D.†
Cleveland, Ohio
and
WALTER L. PALMER, M.D.
Chicago, Ill.

INTRODUCTION

The term refractory is defined as "obstinate" or "unmanageable" and the refractory peptic ulcer generally is regarded as a lesion "resisting ordinary treatment." These terms, though descriptive, do not portray the problem completely. "Ordinary treatment" is not necessarily synonymous with effective therapy. The regimen prescribed in a given case may be inadequate, or the patient, for various reasons, may not adhere to the program. The failure of an ulcer to heal or recur under such circumstances does not represent true intractability, for, under proper conditions, the ulcer does heal. Many cases designated as refractory undoubtedly fall into this category.

In the truly intractable ulcer, usually effective therapy fails to relieve ulcer pain, promote healing, or to prevent complications. The immediate cause may be emotional stress, stenosis, delayed gastric emptying, or penetration of the ulcer into adjacent structures. The fundamental problem usually is failure to adequately neutralize or suppress gastric secretion. The role of the acid may be likened to that of the indispensable catalyst in a chemical reaction; its presence facilitates the process of ulceration; its sustained elimination will result in complete and sustained healing, regardless of other factors. In duodenal and jejunal ulcer the difficulty appears to be uncontrollable hypersecretion of acid. In gastric ulcer the acid output is not excessive quantitatively but it exceeds the lowered

*Presented before the Course in Postgraduate Gastroenterology of the National Gastroenterological Association, Chicago, Ill., 20, 21, 22 September 1951.

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"tissue resistance" of the gastric wall. Various aspects of the refractory ulcer have been discussed elsewhere[1,2]. The purpose of this paper is to describe additional experience with the problem, as illustrated by the course of 15 patients.

Emotional Factors

Case 1, A. V. #403855:—A 49-year-old male, developed ulcer distress in 1926. The perforation of a duodenal ulcer several months later necessitated surgical closure. Recurrent symptoms in 1928 led to a gastroenterostomy. Since 1930 ulcer distress had recurred at frequent intervals. Initially, diet and antacids provided complete relief; gradually medical treatment proved less and less effective. The patient was first seen by us in March, 1947. Roentgen examination indicated marked deformity of the duodenal bulb; a stomal ulcer was not demonstrated. Because of persistent symptoms, however, the patient underwent surgical exploration; operation revealed evidence of an old stomal ulcer; a vagotomy and entero-enterostomy were performed. Nine months later the patient developd a massive hemorrhage which subsided with continuous day and night antacid therapy. The insulin test on two occasions was negative. Roentgen irradiation then was directed to the upper two-thirds of the stomach. The patient has continued the use of calcium carbonate and has had no recurrence; the gastric content does not contain free acid. One year ago he also manifested numerous hypochondriacal symptoms related to long-continued "intractable" difficulty with his wife. These subsided after a divorce and a more satisfactory second marriage.

Comment:—This patient's intractable ulcer appeared attributable to an intractable wife whose harmful influence obviously exceeded the potential benefits of medical treatment and of vagotomy. The combination of x-ray therapy decreasing acid secretion and a happy re-marriage apparently has solved the problem.

Case 2, E. S. #386935:—A 60-year-old man, had experienced recurrent ulcer distress since 1928. The past history and background are of particular interest and importance. His father had been chronically ill and the patient was required to work at the age of 12. The father died when the patient was 18. He became affiliated with a business concern and within two years (1909) was its outstanding salesman, a position he has maintained subsequently. In 1914 he contracted gonorrhea which was treated and pronounced cured. In 1914 he married. In 1918, after the birth of his first child, the patient's wife developed obscure pelvic complaints. In his anxiety the patient told his wife and her doctor of the premarital gonorrhea. Both the wife and the doctor blamed the husband for his wife's illness. Several years later a second child died soon after birth, the death being attributed to congenital defects. Again the doctor and the wife incriminated the husband. A healthy son was born in 1927. The patient's symptoms developed one year later. He was frequently accused by his wife of infidelity; sexual relations between the two ceased entirely in 1939. In 1940 he experienced a severe gastrointestinal hemor-

rhage. In March, 1942, one month after the death of his mother, the patient developed a perforation requiring surgical closure. In 1943 he was unjustly accused of embezzling church funds, whereas, in fact, he had been an important contributor. He was completely exonerated; nevertheless, he felt unable to return to his church. Symptoms recurred frequently and increased in severity. In January, 1946 he underwent a subtotal gastric resection. Ulcer distress returned four weeks later. The pain was continuous, very severe, and only partially relieved by food or alkali. As a consequence, he received opiates and within five months became addicted to morphine. He was first seen by us in July, 1946. X-rays demonstrated a large ulcer on the lesser curvature of the stomach immediately proximal to the gastroenterostomy stoma. Therapy was extremely difficult, involving a serious emotional problem, "intractable" ulcer, and morphine addiction. The ulcer healed during carefully supervised antacid treatment, gastric irradiation, and intensive psychotherapy. He was cured of his morphine addiction. He has not had ulcer symptoms since leaving the hospital in 1946 but has experienced many hypochondriacal complaints.

Comment:—This patient, in the opinion of the psychiatrists, represented the classic example of "a basic unconscious conflict between the drive for independence and powerful, repressed dependent needs". He had been exposed to "a series of fateful life events, each constituting a severe blow to his self-esteem". His personality pattern also was characterized by "deeply repressed strong hostile impulses". It may be argued that medical treatment and subtotal gastric resection failed because of failure to recognize and properly deal with the emotional problems. The administration of morphine in an effort to relieve the pain of recurrent ulceration four weeks after gastric resection was unwise medically because it is not the treatment for ulcer distress, and unwise psychiatrically because it produced addiction and it evaded the chief problem. The healing of the ulcer is attributable to the combination of effective antacid management and skillful psychotherapy.

Case 3, J. P. I. #434996:—A 35-year-old attorney developed ulcer distress in 1939. Proprietary medicines were prescribed by his physician, but the patient continued to experience frequent recurrences. He was first seen at the University of Chicago Clinics in June, 1948. The twelve-hour night gastric secretion exceeded 2,000 c.c., with a free acidity reaching 94 clinical units; after histamine stimulation the values reached a maximum of 110. X-rays demonstrated a duodenal ulcer with crater. A vagotomy and gastroenterostomy were performed. The patient experienced bloating, episodes of diarrhea and mid-epigastric pain. The insulin test was positive. The nocturnal gastric secretion remained excessive. In June, 1950, he received roentgen irradiation to the upper two-thirds of the stomach, for a total of 1,650 r. Distress recurred in July, 1950, and was not relieved by Banthine; the symptoms actually were more compatible with a functional gastrointestinal disturbance. In November, 1950, x-rays suggested a jejunal ulcer. In December, 1950, he underwent a partial gastric resection; no ulcer was demonstrable at operation.

In May, 1951, the patient described recurrent symptoms identical with those present before the gastric resection.

Comment:—In retrospect, this patient's symptoms after vagotomy were chiefly, if not exclusively, those of a functional gastrointestinal disturbance. The absence of ulceration at the time of the second operation would support this view. Functional gastrointestinal disorders in patients with duodenal ulcer deformity are frequent causes of postoperative "failures"; neither vagotomy nor gastric resection solves problems of this type. Perhaps the proper designation for this case, rather than refractory ulcer, should be refractory patient.

Inadequate Medical Treatment

Case 4, G. M. #520759:—A 57-year-old male, developed ulcer distress in 1944, after a prolonged bout of alcoholism. Roentgen examination demonstrated a duodenal ulcer. Symptoms persisted during the administration of aluminum hydroxide but subsided with the use of "Sippy" powders. Recurrent distress in September, 1950 again did not respond to aluminum hydroxide, magnesium trisilicate, or bismuth. The pain increased, was especially severe at night, and was relieved partially by opiates. Surgical treatment was recommended but rejected by the patient. Examination at the University of Chicago Clinics (February 1951) demonstrated a duodenal ulcer without stenosis. The basal gastric secretion was high and after histamine the free acidity rose to 134 clinical units. Pain persisted for four days during the hourly administration of milk and cream and 2.0 gm. of calcium carbonate. The quantity of antacid then was increased to 4.0 gm. hourly during the day and evening. Symptoms subsided promptly and the patient has remained well to the present time.

Comment:—This patient did not have a refractory ulcer, for with antacid therapy, sufficient to control the excessive secretion of acid, the lesion healed and did not require surgery, as had been recommended elsewhere. Previous attempts to neutralize gastric acidity were inadequate. Bismuth has no antacid value; its alleged coating properties have not been established; furthermore, the alleged therapeutic value of coating ulcers is not proven. Although aluminum hydroxide or magnesium trisilicate partially neutralize gastric acidity, they may be inadequate to control the excessive secretion in patients with duodenal ulcer, even when administered in large quantities.

Failure of Standard Antacid Therapy; Permanent Healing After the Complete Elimination of Free Acid

Case 5, M. N. #165135:—A 77-year-old housewife, developed ulcer symptoms in 1934. X-rays and gastroscopy in December, 1936 revealed a huge benign-appearing gastric ulcer. The crater healed after several months of antacid therapy with calcium carbonate and milk and cream. During the subsequent five years the ulcer recurred at frequent intervals. The lesion was especially well visualized at

gastroscopy and the patient underwent 67 such examinations. The maximum free acidity after histamine stimulation originally approximated 70 clinical units and subsequently ranged between 30 and 60 clinical units. Anacidity developed spontaneously in 1941. Symptoms subsided promptly. The ulcer healed and has not recurred.

Case 6, A. K. #148736:—A 79-year-old woman, had experienced ulcer distress since 1905; symptoms were controlled by conventional therapy but recurred frequently. She was first seen by us in 1936. Roentgen and gastroscopic study disclosed a benign-appearing gastric ulcer. The maximum free acidity after histamine was 38 clinical units. During the next ten years the peak free acidities ranged from 25 to 40 clinical units. The patient underwent innumerable x-ray studies and more than 100 gastroscopies. Despite adherence to an antacid regimen at home and in the hospital, the ulcer persisted and was visualized in all but five gastroscopies. In 1946, 1,600 r of roentgen irradiation were directed to the upper two-thirds of the stomach. Histamine-anacidity developed and has persisted to the present time. Symptoms subsided promptly; the ulcer healed completely and the patient has remained well.

Comment:—Gastric secretion, though not excessive, apparently exceeded the lowered tissue resistance of the gastric mucosa in both patients. The spontaneous development of anacidity in Case 5 and the x-ray induced anacidity in Case 6 resulted in complete and permanent healing. These observations again emphasize the indispensable role of acid gastric juice in the formation and persistence of peptic ulcer.

Case 7, M. K. #478955:—A 69-year-old man had experienced recurrent ulcer distress since 1928; the diagnosis of duodenal ulcer was established by x-ray. Symptoms returned in December 1948 and a crater was demonstrated roentgenologically. A modified antacid regimen relieved the distress and the crater disappeared. In September, 1950, the patient felt well and had discontinued treatment. He now received Banthine, 50 mg. four times daily, as a prophylactic measure. However, ulcer distress recurred three weeks later. X-rays now demonstrated a large ulcer on the lesser curvature of the stomach. Since the lesion did not heal during a rigid antacid program at home, therapy was continued in the hospital. In addition, roentgen irradiation, approximately 1,600 r, was directed to the fundus and body of the stomach in an effort to reduce the high gastric secretory output. Histamine-achlorhydria developed soon thereafter; the ulcer healed and the patient remains free of symptoms.

Case 8, J. C. #201300:—A 53-year-old male, developed ulcer symptoms in 1936, immediately after the death of his mother. A diagnosis of duodenal ulcer was established in 1938 but the patient refused treatment. He returned in November, 1944, with a history of annual recurrences of distress and a recent episode of hematemesis. Roentgen examination disclosed both gastric and duodenal ulcers. The free acidity after histamine stimulation reached 85 clinical units. Roentgen

irradiation, 1,600 r, was directed to the fundus and body of the stomach. Histamine anacidity developed shortly thereafter and has continued to the present time. The ulcers healed promptly and the patient remains well.

Comment:—The failure of Banthine to prevent the development of a gastric ulcer in Case 7 is of interest; however, this experience is not unique. The elimination of hydrochloric acid by roentgen irradiation eliminated the ulcer problem in both patients.

FAILURE OF MEDICAL TREATMENT — SURGICAL TREATMENT SUCCESSFUL

Case 9, E. M. #460965:—A 47-year-old man had noted ulcer distress since January, 1948. Treatment with pills and Vitamin B failed to relieve the symptoms. X-rays at the University of Chicago Clinics (January, 1948) demonstrated a large ulcer crater high on the lesser curvature of the stomach. Severe hematemesis and melena occurred while the patient was awaiting hospitalization; 1,800 c.c. of blood were administered. The bleeding subsided during continuous day and night antacid therapy. Roentgen and gastroscopic studies again disclosed a large gastric ulcer. The free acid after histamine reached a peak of 50 clinical units. Since the clinical evidence suggested benign ulcer, treatment consisted of hourly milk and cream and calcium carbonate; roentgen irradiation, 1,600 r, was directed to the upper two-thirds of the stomach. Large quantities of calcium carbonate, 60 to 75 gm. daily, failed to control the severe pain. However, the development of histamine-achlorhydria after x-ray therapy (March, 1949) resulted in healing of the ulcer within three weeks. Unfortunately, the anacidity was temporary and the gastric secretory output returned to original levels (December, 1949). In spite of faithful adherence to the antacid regimen, ulcer distress recurred nine months after the irradiation. X-rays again revealed a large gastric ulcer. In January, 1950, a subtotal gastric resection and a vagotomy were performed with uneventful recovery. The ulcer, on histologic examination, was benign. The patient has remained well to the present time.

Comment:—The persistence and recurrence of the ulcer in this patient must be attributed to the failure in controlling acid secretion, for the lesion healed during the period of x-ray induced anacidity. Partial gastric resection is the procedure of choice for benign gastric ulcer when surgery becomes necessary.

Case 10, W. G. #144032:—A 62-year-old male, developed ulcer distress in 1922. Nine years previously he had undergone some type of operative procedure upon the stomach. He was first seen by us in 1936. X-ray and gastroscopic study demonstrated a benign-appearing gastric ulcer. The free acidity after histamine reached a peak of 115 clinical units. Strict antacid therapy relieved the symptoms and the ulcer healed. The lesion recurred six months later. Treatment in the hospital once more was helpful temporarily. Roentgen irradiation to the upper two-thirds of the stomach had little effect on the gastric secretory output. During the period 1936 to 1949 the patient underwent more than 50 x-ray studies and in

excess of 120 gastroscopic examinations. The gastric ulcer was visualized consistently. Despite faithful adherence to antacid therapy at home and frequently in the hospital, and in spite of a variety of other therapeutic measures, gastric secretion could not be neutralized or eliminated completely. Two additional courses of x-ray therapy in 1939 and 1942 again were without effect on gastric secretion. The maximum free acidity after histamine ranged between 50 and 90 clinical units. In 1949 the gastric ulcer was excised. Histologic examination indicated a benign lesion. Postoperative obstruction necessitated a pyloroplasty and then a subtotal gastric resection. The patient remains free of ulcer distress at the present time.

Comment:—This case is of special interest because of the almost constant persistence of the gastric ulcer for at least 27 years. Despite the clinical chronicity, the histologic appearance of the lesion was indistinguishable from that of a benign ulcer of brief duration. The absence of neoplasia in a gastric ulcer persisting for 27 years is noteworthy in relation to the question of neoplasia in benign gastric ulcer. The explanation for the failure of medical treatment and x-ray therapy to control the acid secretion is not apparent.

Case 11, R. L. H. #458627:—A 52-year-old male, had experienced digestive symptoms, relieved by milk or sodium bicarbonate, since 1934. He first sought medical care in 1936 after a hematemesis. The diagnosis of duodenal ulcer was established by x-ray. Treatment, consisting of a soft diet and occasionally milk and cream, prescribed elsewhere, did not relieve the distress. Administration of histidine parenterally and an extract of hog's intestine orally also were ineffective. He entered the Albert Merritt Billings Hospital in February, 1949, because of hemorrhage, necessitating a transfusion of 500 c.c. of blood. Repeated emesis resulted in a severe alkalosis, characterized clinically by psychotic behavior and chemically by a serum chloride of 79.8mM/L, CO_2 43mM/L and pH 7.66. The alkalosis was corrected within 10 hours by the intravenous administration of 2 per cent ammonium chloride and isotonic saline solutions. On the fifth hospital day the ulcer perforated, necessitating closure; there was marked stenosis of the duodenum. On the 25th hospital day the patient underwent a transabdominal vagotomy and gastroenterostomy with an uneventful recovery. In March, 1951, he indicated by letter that he was in excellent health and had gained 30 pounds.

Comment:—The treatment prescribed in this patient prior to 1949 was grossly inadequate. The frequent recurrences culminated in a striking sequence of complications: hemorrhage, obstruction, vomiting, alkalosis, perforation, and obstruction, dealt with most effectively first by closure of the perforation and subsequently by vagotomy and gastroenterostomy.

Case 12, C. F. #458237:—A 65-year-old male, first experienced ulcer distress in 1912. The ulcer perforated in 1922, requiring surgical closure. A gastroenterostomy was established in 1923. Operation was necessary again in 1924 to relieve small bowel obstruction. A gastrojejunocolic fistula in 1939 required repair and

re-establishment of normal bowel continuity. Ulcer symptoms recurred and did not respond consistently to milk and cream and alkali. The patient was first seen at the University of Chicago Clinics in December, 1948. The 12-hour nocturnal gastric secretion was enormous, with a volume of 2,120 c.c. and 93 units of free acid. X-rays demonstrated a duodenal ulcer crater. A vagotomy and posterior gastroenterostomy were performed. In January, 1950, the insulin test was negative; the nocturnal gastric secretion had diminished to volumes of 335 and 290 c.c. without free acid. In February, 1951, the patient reported the absence of ulcer distress but was troubled with episodes of severe diarrhea.

Comment:—This patient also had experienced serious complications of peptic ulcer. The output of hydrochloric acid in the 12-hour nocturnal gastric secretion was enormous, exceeding 7,000 mg.; the hyper-hypersecretion, in our opinion, was responsible for the refractory course. Vagotomy and gastroenterostomy led to healing of the ulcer, but the subsequent diarrhea has been distressing.

Failure of Both Medical and Surgical Treatment — Truly Intractable Ulcers

Case 13, E. M. #370734:—A 61-year-old male, had noted ulcer distress since 1943. In 1945 a perforated duodenal ulcer was treated by simple closure. Symptoms returned in November, 1945. X-rays disclosed a duodenal ulcer with crater. The free acidity, after histamine, reached 128 clinical units. The ulcer healed during antacid therapy but recurred in March, 1946. The 12-hour nocturnal gastric secretion approximated 4,000 mg. free hydrochloric acid, greatly exceeding normal values. A transabdominal vagotomy and gastroenterostomy were performed in July, 1946. A jejunal ulcer was diagnosed by x-ray in February, 1947; the insulin test was positive. In April, 1947, a second transabdominal vagotomy was performed, several previously uncut vagus fibres being severed. The insulin tests postoperatively remained positive. The patient then received roentgen irradiation to the upper two-thirds of the stomach. In July, 1947, a partial gastric resection was planned, but the perforation of a jejunal ulcer at operation necessitated resection of the anastomosed jejunal segment and re-establishment of normal bowel continuity. Despite the three operations and the roentgen irradiation, the nocturnal secretion of acid remained enormous, frequently exceeding 4,000 mg. Atropine had practically no effect upon the hypersecretion. The patient subsequently developed a recurrent duodenal ulcer and resumed antacid medication. However, he died in October, 1947, after an episode of bleeding. At autopsy, apparently viable nerve tissue was noted histologically in the walls of the esophagus and the stomach.

Case 14, G. S. #404603:—A 46-year-old male, had experienced recurrent ulcer distress since 1926. Treatment consisted chiefly of milk or sodium bicarbonate. The patient vomited frequently during 1944 and 1945 and developed alkalosis. At operation elsewhere in February, 1947, three-fourths of the stomach was re-

sected and the mucosa of the first portion of the duodenum was removed. Severe ulcer distress with nausea and vomiting developed two and one-half weeks later. X-rays in March, 1947 at the University of Chicago Clinics, revealed a huge jejunal ulcer. The 12-hour nocturnal gastric secretion consistently exceeded 5,000 mg. of hydrochloric acid; after histamine the free acid rose to 128 clinical units. Large quantities of calcium carbonate and continuous gastric aspiration were necessary to relieve the pain. A transthoracic vagotomy was performed in April, 1947. The output of acid decreased markedly and the ulcer healed. Acid secretion then gradually rose to original levels and symptoms returned in September, 1947. Roentgen and gastroscopic study now disclosed another jejunal ulcer. The output of acid remained high despite antacid therapy. The course was further complicated by a gastrojejunocolic fistula and bleeding. At the third operation in October, 1947, the fistula was resected; an intact vagus fibre was located and severed. The patient died of persistent massive hemorrhage on the fifth postoperative day, despite the administration of large quantities of blood. Necropsy revealed a large jejunal ulcer with an open blood vessel in its base.

Comment:—Cases 13 and 14 have been described in greater detail elsewhere[3]. They emphasize, among other features, the virtual impossibility of achieving a complete vagotomy in some cases, and the ineffectiveness of extensive gastric resection in a patient with duodenal ulcer and hypersecretion of acid. The enormous outputs of hydrochloric acid after surgical removal of the antrum are of particular interest in relation to recent studies demonstrating the important stimulating effect of the antrum and the hormone gastrin upon gastric secretion in the dog.

Case 15, G. J. #130626:—A 52-year-old male, developed ulcer distress in 1928. In 1930 he experienced a massive hemorrhage, and six months later underwent a gastroenterostomy for duodenal ulcer. A stomal ulcer developed in 1934. In March, 1935 symptoms consisted of diarrhea and rapid loss of 30 pounds in weight. A jejunal ulcer had perforated, resulting in a jejunocolic fistula, visualized by x-ray. At operation the fistula was repaired and normal bowel continuity was re-established. In September, 1935, roentgen examination revealed a recurrent duodenal ulcer. In April, 1936 a partial gastrectomy and posterior Polya gastrojejunostomy were performed. In August, 1936, a gastroscopy disclosed an erosive, ulcerative jejunitis. X-rays demonstrated another jejunal ulcer. The lesion gradually healed during antacid treatment but recurred in February, 1937 and was complicated by severe hemorrhage. Again antacid therapy was of temporary benefit. In April, 1937, a recurrent jejunal ulcer was demonstrable by x-ray; gastroscopy disclosed also an erosive jejunitis. Treatment consisted of diet and the use of tricalsate and aluminum hydroxide. In June, 1937, 2,990 r of roentgen irradiation were directed to the fundus and body of the stomach. The histamine-stimulated gastric acidity decreased from 95 clinical units to zero and the patient was free of symptoms for the first time in years. Acid secretion began to return in March, 1938. In August, 1939 a jejunal ulcer was again demonstrated. The crater healed during antacid therapy. During the subsequent two years the patient's

symptoms were referable to an irritable colon. In April, 1941, he re-entered the hospital for the eighth time. X-rays revealed another jejunal ulcer. He now received a second course of irradiation (900 r). The maximum free acidity diminished from 49 to 9 clinical units. Symptoms subsided, the ulcer healed, and the patient was free of abdominal distress until 1946. In February, 1946, he underwent a left nephrectomy; the histologic diagnoses were chronic pyelitis and pyelonephritis. In May, 1946 the symptoms and clinical findings indicated the probable perforation of a jejunal ulcer with localized peritonitis. The patient recovered without surgery, on treatment including penicillin and the administration of milk and cream and calcium carbonate. He then remained well until March, 1948. At this time he died suddenly of hemorrhage. Necropsy revealed the stomach distended with blood and containing many erosions but no actual ulceration.

Comment:—This patient probably represents the most refractory peptic ulcer in our experience. The remarkable succession of recurrences and complications was retarded only during the periods 1937-1939 and 1941-1946, after the gastric acidity had been eliminated or greatly diminished by roentgen irradiation. The cause of the terminal gastric erosions and of the unusual tendency to ulceration in this case are not known; therein lies the enigma of the truly refractory peptic ulcer.

Summary

The problem of the refractory peptic ulcer has been discussed in relation to the course of events in 15 patients. The causes vary with the individual patient but are generally referable to failure in completely controlling the acid gastric secretion.

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Discussion

Dr. O. H. Wangensteen:—I suppose the internist should have the last word even in a discussion such as this. It is quite proper therefore that I precede Dr. Kirsner in the concluding discussion, even though the internist precedes the surgeon in invoking therapeutic procedures in the management of patients with peptic ulcer.

I think all of us enjoyed the discussions. In the minds of some the suggestion that, x-ray treatment benefits ulcers may bring forth some skeptics. Dr. Levin, apparently, was able to show us some cases, in which it did good. It would be inter-

esting to see the parietal cells, to note whether x-ray treatment actually produced atrophy.

There are a couple papers in the literature, I believe, one by Bricker, and one by Bowers, in which teratoma of the testicle with retroperitoneal metastases was treated by x-ray irradiation and the patients developed spontaneous gastric ulcers, following the x-ray treatments. I will not count myself among the scoffers, of this treatment, for all ulcer therapeutists live in glass houses. But I would count myself amongst the doubting Thomases who would like to see the atrophy of the parietal and chief cells, responsible for that improvement.

Dr. Levin spoke of a few cases in which patients with gastric ulcer became hypochlorhydric through the agency of the aging factor alone. There is no simple or completely effective treatment for ulcer; there is no treatment without its drawbacks. Professor Meulengracht of Copenhagen, I believe, still writes and speaks of the medical treatment of bleeding ulcer with enthusiasm. Yet, his associate, Krarup (Acta med. Scand. **123**:181-207, 1946) states that the recurrence rate has been so high (40 to 60 per cent) that, in Meulengracht's Clinic at the Bispebjerg Hospital, gastric resection is used much more liberally now than formerly in the management of peptic ulcer.

Will Mayo asked long years ago: "How many recurrences shall an ulcer patient have before more effective treatment is suggested to him?" I have heard patients tearfully suggest, after obtaining satisfying relief from an operation: "Why was I put off so long?" It is frequently a good question.

I doubt that one should speak of intractable ulcer. I think we should speak of "ineffective treatment". Dr. Levin himself showed us cases in which eventually the proper treatment was instituted and the patient got well; and others were apparently allowed to die without any attempt being made at re-resection. I submit, that is not complete treatment.

I have myself twice during the past two years resected the stomach of patients who first had a perforation; then a gastrojejunostomy: then vagotomy, followed in each instance by three successive resections. These patients were operated upon by well-known gastric surgeons. Each surgeon had contemplated a total gastrectomy as a final gesture. In both instances, I performed re-resection. Both patients are well. In both instances, a fairly large residual gastric pouch still remained. There was still considerable fundic stomach attached to the diaphragm and to the posterior abdominal wall in the area of the spleen in both patients. A sternotomy incision simplifies the exposure, such that this area of the stomach comes into view.

There is a difference between choosing a standard operation and making a par-performance of a standard operation. Occasionally, for many reasons the operation one planned to do turned out to be something less than was intended. It is in large, hypersthenic patients, who are considerably overweight that, the sur-

geon's effort frequently turns out to be something less than was intended. Adiposity in patients makes surgical exposure as well as performance of the procedure difficult. It is very doubtful whether we are justified in labelling an ulcer as intractable. Some ulcers, obviously, are more difficult to cure than others; in fact, I have elsewhere spoken of the myth of the intractable ulcer (Wisconsin M. J. **44**:878-888, 1945). Certainly, all has not been said that can or will be said on ulcer management. It is yet too early to predict what the final word will be in the treatment of peptic ulcer.

I have been derelict enough within the past year to backslide to the extent of resurrecting an operation which had been dead and buried for almost 40 years. Whether enough life has been breathed into it to have it stay, remains to be seen. Time is the great and final arbiter in all things. It does not make too much difference what is said here: time will decide what the best management of peptic ulcer is. Yet, we need some guides for our present-day problems.

Mikulicz (1897) originated segmental resection for gastric ulcer. He gave the operation up because he found that the residual stomach did not empty properly. And, as I said yesterday in discussing esophageal lesions and the ulcer problem, Riedel and Payr took up segmental resection for gastric ulcer some years later, but they too gave it up. I took up an extended type of segmental resection for duodenal ulcer, excising in the area of 90 per cent of the acid secreting area. However, I had to learn for myself that when you transect a stomach in a crosswise manner, you vagotomize the antral segment; in the presence of a duodenal ulcer, a vagotomized antrum precludes satisfactory emptying.

Vagotomy in the dog protects against the histamine-provoked ulcer. However, without a complemental gastrojejunostomy, at least in man, a vagotomized stomach will not empty.

I do not wish to affect the role of even a minor prophet, but I believe this experiment has validity for our thinking here. Inasmuch as a simultaneously performed drainage operation, such as gastrojejunostomy robs vagotomy of a good deal of its protective influence against the histamine-provoked ulcer, it seems unlikely that the result will be different in man. As time goes by, I am inclined to believe that the occurrence of gastrojejunal ulcer, after vagotomy and gastrojejunostomy will be observed frequently enough to suggest that it is an inadequate operation for duodenal ulcer.

Dr. Erwin Levin:—I just want to say one thing about x-ray therapy if I may. I want to make this point clear: Dr. Palmer and Dr. Kirsner and I do not say that x-ray therapy is a cure for peptic ulcer. What is being done with x-ray therapy is that it is being used as an adjunct to the treatment of peptic ulcer. The reason for its use is that we think this is one possible way which can reduce the acid secretion in some patients.

Since 1937 about one thousand patients have been treated with roentgen therapy, and at present these cases are being reviewed so I can't give you any exact figures. So far we haven't seen a carcinoma develop in our patients due to x-ray therapy. We have had carcinomas develop in some of the patients, but there was no relationship to the x-ray therapy. One patient I showed today had carcinoma of the lung. Another one developed carcinoma of the colon, but the incidence of carcinoma in the series is no greater than in the population at large. The dose administered is 1,600 r to the body and fundus of the stomach. As yet we haven't seen an ulcer develop from this dose.

Dr. Miller asked how do we diagnose benign gastric ulcer. I agree with everyone that the only way to make a definite diagnosis of benign ulcer is by microscopic examination. We don't believe that every gastric ulcer should be resected. We like to try to make the diagnosis, and we treat these people medically only if we are sure they will be under our care and supervision and will report back frequently so we can do repeated x-ray and gastroscopic examinations and anything else that is necessary.

THE INDICATIONS FOR VAGOTOMY IN THE SURGICAL TREATMENT OF THE PATIENT WITH CHRONIC PEPTIC ULCER WHICH HAS FAILED TO RESPOND TO MEDICAL MANAGEMENT*

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It is fair to say, I think, that vagotomy (or vagus nerve resection, as it should be called) as a method of treatment for chronic peptic ulcer is very definitely still on trial. And when I say chronic peptic ulcer, I mean chronic duodenal ulcer, because I am convinced that with chronic gastric ulcer, resection is the procedure of choice. Most of us well remember, of course, the widespread enthusiasm with which Dragstedt's work in this field, both experimental and clinical, was received in 1943. Many people thought that at last an operation for ulcer had been devised which was a "cure-all". Surgeons the country over were anxious to try it out, in most instances without having adequate knowledge of the anatomical distribution of the vagus nerves, or without having adequate technical ability to perform such a procedure accurately. Moreover, many patients were subjected to this operation who were not adequately studied beforehand, and therefore, vagotomy was used without too clear indications for its use. It is no wonder that too often the results were unsuccessful and disappointing, and that the enthusiasm for this procedure in many clinics has gradually cooled off, and in some places has even been discarded altogether. But in spite of this apparent tendency, the fact remains that in Dragstedt's clinic and in several other clinics in this country where the operation has been given the most careful trial and consideration over a period of years, the results obtained thus far seem to be so satisfactory that the procedure appears to be well established permanently.

The surgeon, when about to operate on a patient with a chronic peptic ulcer, should always have an open mind, and should make his decision as to the procedure only after the clinical picture has been most carefully studied and the pathology analyzed with the abdomen opened. What are the alternatives?

1. *Gastroenterostomy:*—If obstruction has always been the prominent feature of the clinical picture, if the patient is well along in years, and if the acid values are not too high, I believe that a well performed posterior gastroenterostomy is the operation of choice. It admirably accomplishes its objective and the mortality is very low. In choosing the site for the new opening, it is important to have the stoma in the most dependent part of the stomach, i.e., just opposite the notch on

*Presented before the Course in Postgraduate Gastroenterology of the National Gastroenterological Association, Chicago, Ill., 20, 21, 22 September 1951.

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the lesser curvature and as close to the greater curvature as possible. Moreover, the opening should not be too big, (which might permit a too rapid dumping of the stomach) never more than two inches long, the ideal being the diameter of the adjacent jejunal loop, after allowance has been made for shrinkage due to healing. Good results can be expected in approximately 85 per cent of these patients.

2. *Resection:*—In the patient with an intractable duodenal ulcer which has bled considerably; which has never perforated; when the insulin test shows a relatively mild response to hypoglycemia, indicating that the cephalic phase of gastric secretion is not too important a factor; and where abdominal exploration indicates that the duodenum can be freely mobilized and accurately turned in, I'm quite sure that resection in competent hands is the procedure of choice. It should be carried out with a mortality close to 2-3 per cent, and the results should be satisfactory in approximately 80-85 per cent of the patients. In considering the technical aspects of resection, I believe that if the preoperative flouroscopic examination shows that the stomach lies fairly low with the patient in the upright position, and the patient is not too fat, and there is a fairly long transverse mesocolon, the postcolic Hoffmeister-Polya type of anastomosis with the jejunum would probably be safe most of the time. It offers the distinct advantage of a very short afferent jejunal loop, and thus diminishes the likelihood of stomach ulcer. However, if, under the fluoroscope and at operation, the stomach appears to be very high, the patient is very fat, and the transverse mesacolon is short, there is usually a dangerous tendency for the remaining portion of the stomach after resection to be pulled up quite high under the ribs, and a considerable likelihood of the transverse mesacolon acting like an umbrella over the anastomotic site and therefore considerable possibility of a compression obstruction of either the afferent or efferent loops (or both) at the stoma. For these reasons, I have, for several years, adopted the antecolic type of of Polya-Hoffmeister technic which allows one to make the anastomosis free from tension or compression no matter how extensive the resection may be. I always attach the afferent jejunal loop at the lesser curvature, and allow the efferent loop to come directly down from the greater curvature end of the anastomosis. Also, I frequently stitch in a few places the anterior surface of the afferent loop to the free margin of the left lobe of the liver with very fine thread so as to maintain a very broad curve, and also to prevent this loop from being displaced in front of the liver. And finally, I like to employ a Rawson-Abbott tube instead of a Levin tube, so that when the anastomosis is completed I can thread it down through the stoma for 8 or 10 inches into the efferent loop of jejunum, and thus keep the stomach deflated and at the same time allow the use of a slow drip, if desired. This, I believe, has a very definite tendency to minimize the likelihood of a nonfunctioning anastomosis.

3. *Vagotomy:*—In the first place, it is fairly well established by most surgeons that in conjunction with vagotomy, a posterior gastroenterostomy should be used. Even though the postoperative course has been satisfactory in approximately 10 per cent of my own patients in whom vagotomy was used alone, because of the

absence of obstruction, there is no question in my mind but that it is much safer if we make a new outlet (if one is not already present) and thus avoid any trouble from too great delay in the emptying of the stomach, which, in some of these people, is very marked for a long time.

What are its indications? As I see it at present, there are three definite indications for vagotomy:

(a) In the patient who has an active stoma ulcer which has followed either a resection or a gastroenterostomy in which obstruction is not demonstrable clinically or by x-ray. In such a patient, I would very strongly consider a transthoracic vagotomy, because this approach carries little, if any, risk; it allows one to do a most accurate resection of all the vagus fibres in a very clear field, and should result in sufficient reduction in the cephalic phase of gastric secretion as to allow for the healing of the stoma ulcer.

(b) In the patient with an intractable chronic duodenal ulcer who has had one or more perforations (which have been closed surgically), and as a result there is an abundant formation of adhesions and scar, making mobilization of the duodenum beyond the ulcer difficult, and therefore a resection hazardous; or where one finds by exploration an inflammatory mass in the first part of the duodenum (which may attain the size of a small orange) which obviously would also make resection an unwise procedure, I have no hesitancy in saying that vagotomy with gastroenterostomy is by far the procedure of choice.

(c) In the patient with intractable ulcer of the duodenum, who is in the middle-age group, who has very high acid values, who is highly nervous, and in whom psychic causes seem to have been a contributing factor in the exacerbation of the ulcer symptoms, and in whom the laboratory tests show a sharp rise in the free acid in the presence of an insulin induced hypoglycemia, there is little if any doubt in my mind that vagotomy and gastroenterostomy are more logical than a resection. Most of us have seen or heard about patients in this class who have undergone resection once, twice or perhaps three times, and still have the ulcer forming tendency, so we know that resection is not always the answer to this very perplexing problem. And in making this decision, one must keep in mind that the mortality rate with vagotomy and gastroenterostomy is about nil, whereas in the best hands with resection, it is at least 2-3 per cent.

Having set forth with some degree of clearness what I consider the indications for vagotomy, let me emphasize one or two of the technical aspects which seem worthy of note: Vagotomy, in order to be successful, must accomplish the division and, if possible, a resection of a short segment of all the fibres of the vagi, between the esophageal plexus, and the stomach. It has long been my opinion (and this is based on many anatomical studies, both in the dissecting room and at the autopsy table) that this can be more accurately accomplished by the transthoracic approach, because just above the diaphragm there are more apt to be fewer and larger trunks, and one can find them more easily here on account of

the very adequate exposure and the almost absence of any bleeding. On the other hand, if we use the abdominal approach, which of course we must do when we wish to make a concomitant gastroenterostomy, we have the definite advantage of being able to see the pathology. But here we occasionally run into a little disadvantage in the matter of exposure, especially where the patient is very fat, and the left lobe of the liver is very large; and also at times we run into troublesome bleeding which somewhat obscures the field and makes the identification of the minute vagus fibres rather difficult. This operation, therefore, because of its exacting requirements, is no job for the novice or the careless surgeon. It must be done by men who have sufficient interest in these problems to spend considerable time in the dissecting laboratory and in the autopsy room, examining many bodies, in order to become familiar with the variations in the distribution of the vagus nerves. Such efforts will bear fruit, because then and only then, can the surgeon operate with the confidence which is necessary if good results from vagotomy are to be expected.

Conclusions

In operating on the patient with a chronic duodenal ulcer which has failed to respond to medical management, the surgeon has three choices as to procedure – gastroenterostomy, resection, and vagotomy with gastroenterostomy. Each of these has been well established physiologically and technically, and each has its clear-cut indications clinically. All three of them should be a part of the armamentarium of the broad-minded surgeon.

Discussion

Dr. O. H. Wangensteen:—Dr. Miller alluded to a problem which has certainly troubled every surgeon, the difficult problem of the supraduodenal ulcer crater. My interest in this problem was excited primarily by a patient I lost. I spent several hours closing a very large supraduodenal ulcer crater. I thought it was a pretty good closure, but it was not good enough, and the patient died. I mulled it over in my mind a long time and finally I resolved to do it in the following way: to make a long linear open slit through the anterior duodenal wall, pylorus and antrum. This opening is then closed transversally – the so-called Heinecke-Mikulicz pyloroplasty. The antrum is allowed to remain; to excise about 90 per cent of the acid-secreting area and unite the antrum to the small residual fundic pouch.

I know that Dr. Dragstedt does not think well of segmental resection – as a matter of fact, at the 1951 meeting of the Surgical Section of the A.M.A., he said it is an unphysiologic operation, and he predicts its failure. Well, that does not bother me very much. My friendship for Dr. Dragstedt will survive any type of criticism he makes about my work, because I have great respect for him as a surgeon and investigator and keen admiration for him as a friend. What I have seen of segmental resection in patients, suggests that, when done as outlined in

this discussion, it protects against recurrent ulcer. Moreover, in the dog this operation protects against the histamine-provoked ulcer – a circumstance that constitutes strong endorsement of any operation.

The prejudice in the surgeon's mind concerning leaving the antrum arises from his experience with the Eiselsberg antral exclusion operation. It is *separation* of the antrum from the acid-secreting area that makes retention of the antrum in a Billroth II procedure dangerous. Our experience with segmental resection affords correlative support to this thesis. Elsewhere in these discussions, I have suggested the possibility of a return to tubular resection with transverse gastroplasty – a modification of a procedure described by me eleven years ago (Surg., Gynec. & Obst. **70**:58-70, 1940). An advantage of that procedure over segmental resection would be that, the antrum would retain its innervation – a desirable objective from the standpoint of motility as well as from appetite. I had hoped that the recreation of a minature gastric pouch as in segmental resection would eliminate the dumping syndrome; I wish I could say it did. I believe there is definitely less upset of the digestive tract following segmental resection than occurs following the conventional Billroth II operation. Certain it is that none of these patients get anemia.

We are now studying the problem of gastric resection in the rat. Every rat with a Billroth II type of gastric resection develops an anemia. The anemia responds however to iron. We have not seen anemia in patients who have undergone segmental resection; nor does it occur apparently after the Billroth I resection.

It is unfortunate that one has to have recourse in 1951 to the knife, removing a large portion of a healthy stomach to get rid of a duodenal ulcer; however, such a procedure seems to be the most effective treatment. Gastroenterostomy and vagotomy probably constitute satisfactory temporary relief, but for future years, reservations must be made with reference to protection against recurrent ulcer in the light of the experiments in which loss of protective action was demonstrated against the histamine provoked ulcer when gastrojejunostomy was added to vagotomy. Moreover, Dr. Dragstedt's colleague, Dr. Walter L. Palmer, (1941) is responsible for the statement that, 40 per cent of the patients, who underwent gastrojejunostomy for duodenal ulcer 5 years previously at the Albert Billings Hospital at the University of Chicago, developed gastrojejunal ulcer.

Let us all hope that, presently, we shall learn enough about the ulcer diathesis such that, the disorder can be controlled by conservative means. It would appear today, however that, when operation is needed, some type of gastric resection affords the greatest promise of relief and protection against recurrent ulcer.

Dr. I Snapper:—How can one decide whether an ulcer of the stomach is benign or malignant? In last year's postgraduate course, Dr. Pack of Memorial Hospital told us that 55 per cent of the ulcers which roentgenologically and gastro-

scopically seemed to be benign and which at gross inspection during operation gave the impression of being benign were malignant microscopically. Therefore, a patient who roentgenologically has an ulcer of the stomach has to be operated upon. For the time being, there is no choice.

It is much more difficult to decide when the time has come to operate upon an ulcer of the duodenum. A patient with an ulcer of the duodenum should not smoke and should not drink. If a patient is willing to give up smoking and alcohol and to follow an ulcer diet which is not too restricted, then if he has no or little complaints, operation should be avoided. If pains persist notwithstanding these measures, he has to be operated upon.

Subtotal resection of the stomach is a crude operation, because the larger part of the stomach is sacrificed whereas only a small area is ulcerated. But, unfortunately, as of today nothing better exists.

Whether gastric resection, with or without vagotomy, or segmental resection, with or without vagatomy, is better, remains a matter only the future will decide. This discussion about the technic of ulcer operations has been continuing for many decades. In the times when gastroenterostomy was popular, the advantages of the anterior over the posterior anastomosis, of the short loop over the long loop, of the retroperistaltic over the isoperistaltic operation, were debated hotly and every surgeon thought that his special technic helped most patients. This discussion is still going on, only the terms have changed and nowadays it is Billroth I, Billroth II, vagotomy, etc. The surgeons are trying hard and fortunately many patients with chronic ulcer are healed after operation.

There are certainly ulcers which are intractable not only so far as medical but also so far as surgical methods are concerned. Fortunately, this group is relatively small.

Dr. C. J. Tidmarsh:—I think Dr. Snapper's philosophy is very interesting. I happen to have been associated with Dr. Gavin Miller, in Montreal, who, I think, was the pioneer in the introduction of gastric resection on this continent. I have worked very closely with him over all these years, and we have had many arguments and discussions such as have occurred here today, but, by and large, so far as we are concerned, I think we agree with what the Chicago Dr. Miller has said in regard to vagotomy. We still prefer resection when it is indicated and then, if there should be, in the very odd case, some trouble after resection, that is the time when Dr. Miller uses vagotomy; however, these discussions will probably go on indefinitely for years to come until we know the cause of ulcer and perhaps are able to apply more specific therapy.

THE RELIABILITY OF ROENTGENOGRAPHIC DIAGNOSIS IN GASTROINTESTINAL DISEASE*

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Introduction

The x-ray study is the most important examination in the patient with a gastrointestinal complaint. The history, physical examination, blood and other laboratory studies, together with endoscopic procedures may contribute help but the x-ray study remains the examination of first importance. Recently Bockus stated that modern gastroenterology owes its very existence to roentgenology and it was only after this method of diagnosis became well developed and widely applied that gastroenterology became established as a specialty.

The ideal roentgen examination of the digestive tract is a combination of fluoroscopy, routine radiographs, spot film studies with and without compression and special film studies in various positions. The examination requires skill, time, effort and a lot of patience. Few procedures in medicine are as rewarding. Whether the studies are normal, reveal organic disease or merely functional disturbance they aid greatly in the evaluation of the problem.

More patients come to the gastroenterologist with functional disturbances than with organic disease. It therefore becomes apparent that there will be a great number of normal roentgen studies. Even though no organic disease is found the studies are very reassuring to the patient and to the physician and provide the basis for treatment.

In a recent paper Sosman stated that 85-90 per cent of significant lesions in the digestive tract are readily demonstrated by x-ray study and that about 90 per cent of these lesions can be identified. He also made the observation that polyps of the colon, superficial erosions in the stomach and some peptic ulcers high up in the stomach are the lesions most frequently overlooked in the gastrointestinal x-ray examination.

Pancreas

The x-ray study gives us little help in diseases of the pancreas. It is a solid organ. It cannot be visualized by filling with barium nor have we any satisfactory way of visualizing it by the use of any dyes.

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*Presented before the Course in Postgraduate Gastroenterology of the National Gastroenterological Association, Chicago, Ill., 20, 21, 22 September 1951.

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There is a great deal of interest in pancreatic disease, both acute and chronic. The patient with an acute abdomen presents a problem for differential diagnosis which now includes not three but four main diseases. To the acute appendix, acute gallbladder and the acutely perforated peptic ulcer we must now add acute pancreatitis. Every patient with an acute abdomen must have a serum amylase determination with other routine laboratory studies. Interest in the problem of chronic relapsing pancreatitis is increasing. The diagnosis of chronic pancreatic disease is difficult. The roentgen study offers only indirect evidence such as pressure defects on the stomach or duodenum. Rarely calcification in the pancreas or pancreatic calculi aid in diagnosis.

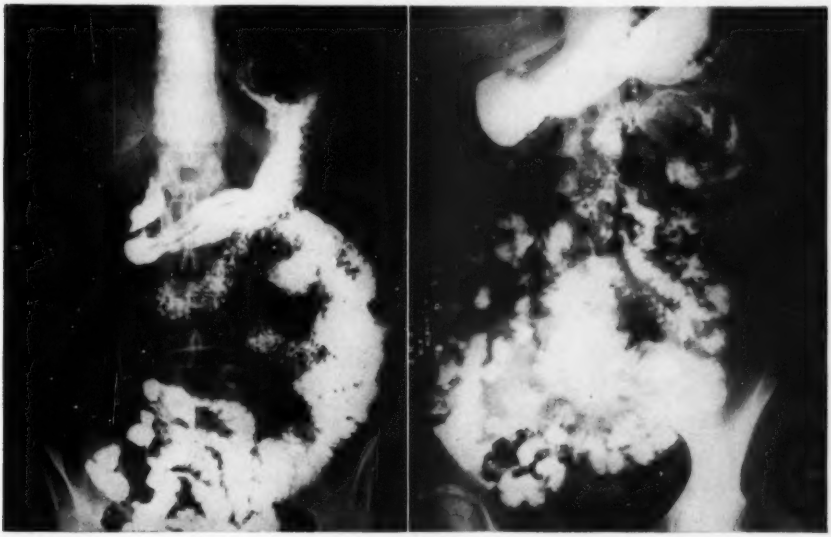

Fig. 1 Fig. 2

Fig. 1—Adenocarcinoma of the jejunum.
Fig. 2—Neurofibroma of the jejunum.

Case 1:—This patient a white male, age fifty-one, had digestive complaints for ten years. These complaints consisted of severe pain requiring opiates for relief. Attacks of nausea and vomiting occurred. There was some weight loss. Occasional jaundice was noted. The x-ray study of the digestive tract revealed dilatation of the stomach and duodenal bulb. The possibility of a postbulbar obstruction from duodenal ulcer or tumor or chronic relapsing pancreatitis was considered. At surgery a chronic relapsing pancreatitis was found. The enlarged pancreas obstructed the duodenum.

Small Intestine

The description of the clinical entity of regional enteritis focused the attention of the medical profession on the much neglected small intestine. As more

and more patients with this disease were diagnosed and treated the importance of examining the small intestine became evident. Methods for the study of this portion of the tract were developed. The most widely used method is that of a mouth meal examination followed by hourly fluoroscopic and film observations.

The indications for such a study are chronic diarrhea, intermittent intestinal obstruction and bleeding from the tract unexplained by the usual examinations of the esophagus, stomach and colon.

Case 2:—This male patient developed diarrhea and weight loss. Crampy pains in the abdomen were noted. The mouth meal x-ray studies revealed regional enteritis involving the terminal ileum and the cecum. This area was resected with a good result.

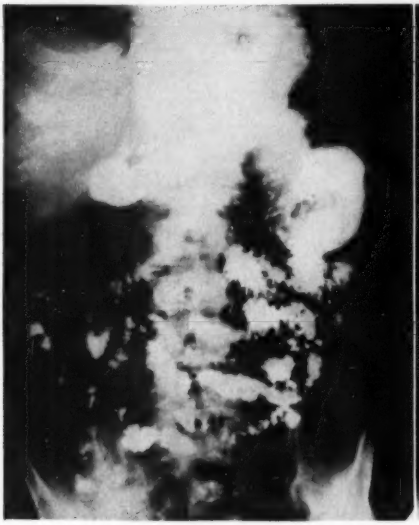

Fig. 3

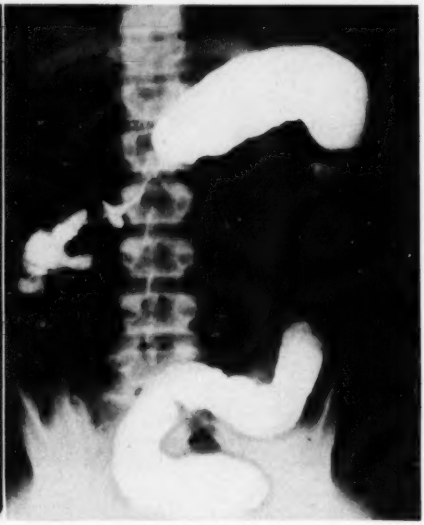

Fig. 4

Fig. 3—Carcinoma of the jejunum.
Fig. 4—Ulcerative colitis complicated with carcinoma.

Case 3:—This was a young man with severe diarrhea, abdominal pain and considerable weight loss. The studies revealed a diffuse ileojejunitis. It was considered too widespread for resection. A medical regime with a high protein, high vitamin diet has kept the general condition under control.

Case 4:—This patient, a woman age fifty-nine, complained of weakness, slight weight loss and occasional crampy distress. Complete roentgen studies elsewhere revealed nothing abnormal. The patient showed a secondary anemia. A small intestinal study revealed changes in the jejunum. There was obliteration of the normal architecture and pooling of barium in this area. A diagnosis of malignancy

of the jejunum was made. This area was resected. The lesion was very extensive (Fig. 1). The pathologist's report was primary carcinoma of the jejunum.

Case 5:—This patient, a woman of fifty-one, had a diffuse neurofibromatosis. She was admitted to the county hospital because of a severe intestinal hemorrhage. On admission she was in shock. She was treated with multiple transfusions and made a fair recovery. Studies were then done to determine the site of hemorrhage. Complete gastrointestinal x-ray studies were reported negative. Proctoscopic examination was negative. The patient while still in the hospital had another severe hemorrhage. The surgical service was asked to see her. They wisely refused to offer any surgical help because no lesion had been found.

This problem was considered at one of our gastrointestinal conferences. It was noted that the jejunum looked somewhat abnormal on the six hour stasis film. Small intestinal studies with particular attention to this region were requested. These studies revealed unmistakable evidence of a lesion in the jejunum. The surgeon removed this lesion which the pathologist described as a neuronimona, a tumor related to neurofibroma and considered benign (Fig. 2). The patient made a prompt recovery.

Case 6:—An elderly white male had considerable digestive trouble for over a year with intermittent attacks of intestinal obstruction. Considerable weight loss was noted. Multiple studies of the gallbladder, stomach and colon were normal.

Our studies revealed evidence of disease in the jejunum which at surgery proved to be a malignancy very widespread with metastasis (Fig. 3).

These studies indicate that we must seriously consider the small intestine in any of our patients where organic disease is not revealed by the usual studies of the esophagus, stomach and colon.

The duodenum and portions of the upper jejunum should be studied in every patient while the upper digestive tract is being examined.

The six hour stasis film should be carefully studied to determine if there is stasis, dilatation or abnormal pattern in the small intestine. Frequently the first lead regarding abnormality in the small bowel comes from observation of this film.

Colon

There is a great interest in polyps of the colon. The relationship of the colon polyp to carcinoma has been well established and the detection of a polyp of the colon and its removal is excellent cancer prevention.

It is sometimes exceedingly difficult to diagnose these polyps. This lesion in the lower rectum is readily seen with the proctoscope and sigmoidoscope. Polyps above this region must be diagnosed by the use of fluoroscopy and film studies.

The most meticulous examination is required and the examination may have to be repeated several times.

The colon must be properly prepared. Castor oil the night before and multiple enemas on the morning of the examination are usually satisfactory. The colon is filled with the usual barium sulphate mixture under fluoroscopic control and a film is taken. Thorough evacuation is necessary before the evacuation film is taken. This film after the bowel is emptied is of utmost importance. It may reveal the necessity for further studies. If any suspicious lesion is seen filling the lower bowel to the mid-descending colon with a dilute barium solution is of great value. Following the evacuation of this second dilute barium mixture the best films have been obtained.

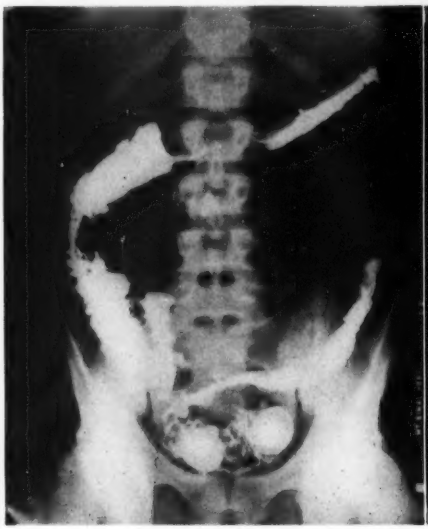

Fig. 5

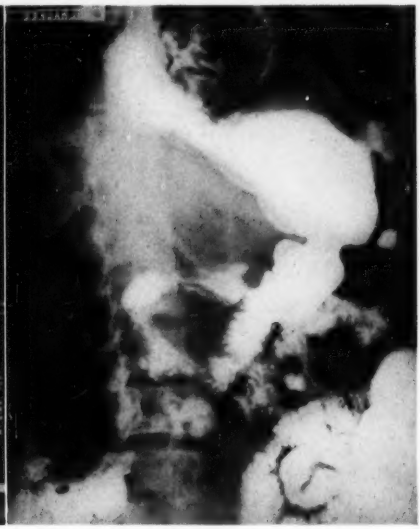

Fig. 6

Fig. 5—Ulcerative colitis complicated with carcinoma.
Fig. 6—Esophageal hiatus hernia.

It is important that these patients be followed after surgery because of recurrences and also because of the discovery of polyps not previously seen.

Sometimes when a polyp or a cluster of polyps is found on proctosigmoidoscopic examination it is assumed that the entire patient's problem will be eradicated when these lesions are removed. This may actually not be so. Many patients had single or multiple polyps removed from eight months to a year before the real cause of their difficulty — carcinoma of the colon was discovered and resected. This therefore must be kept in mind.

Recently there has been a growing concern in some quarters about the possibility of malignancy as a complication of ulcerative colitis.

Case 7:—A male patient, age twenty-seven, gave a history of a severe ulcerative colitis which had been successfully treated medically. For five years the patient considered himself in good health. About six weeks before admittance to the hospital the patient began to have some diarrhea and abdominal pain. These complaints became worse. The bowels became constipated and finally on admission to the hospital the bowels had not moved for twenty-four hours. The flat plate revealed small intestinal dilatation. Medical treatment with gastric suction, fluids, etc., revealed the obstruction. The first diagnostic studies were directed towards the colon. This study, a barium enema, revealed a constriction in the transverse colon. Although a cicatricial stenosis was apparent a malignancy was seriously considered. At surgery a carcinoma with widespread metastasis was found (Figs. 4 and 5). Bargen has now reported 91 cases of this type of complication in ulcerative colitis. It seems that we are now able to keep the patient alive long enough to develop a carcinoma. Bargen feels that the youth of these patients and the highly malignant character of these growths suggest their relationship to the underlying chronic ulcerative colitis.

Peptic Ulcer

The diagnosis of peptic ulcer is usually not difficult when these lesions occur in the stomach and duodenum in their usual sites. When these ulcer lesions occur in the jejunum, esophagus, high up in the stomach or in the postbulbar area more difficulty is encountered in diagnosis.

In gastric ulcer the distinction between a benign and malignant lesion is a difficult one. The general attitude of some surgeons that all ulcerating gastric lesions be operated upon is not valid. Each patient must be treated as an individual. Most gastric ulcers are benign and will heal. The patient whose ulcer heals does not consult a surgeon.

Patients who have these large gastric ulcers, who have a great deal of pain and who are not responding to a medical regime require surgery. In my experience most of these large ulcers though benign are perforated and adherent to contiguous structures like the pancreas and they will not heal medically (Figs. 7 and 8).

The ordinary carcinoma of the stomach offers no problem in diagnosis. These lesions can be identified on fluoroscopy. These are advanced cases and we would rather see earlier lesions that offer problems in diagnosis.

Case 8:—A patient, age forty-one, a white male was referred for examination of the colon and rectum because of bleeding. The presence of bleeding hemorrhoids was noted. The patient however gave a history of gastric discomfort, nausea and weight loss which could not be ignored. The stomach was studied three sep-

arate times. A peculiar defect was noted. A report was submitted to the referring physician with the suggestion that the patient should have surgery. The diagnosis suggested was a carcinoma of the stomach of the infiltrating type. The patient had surgery done. The entire stomach was involved in this malignant process. A total gastrectomy was done. The patient expired two and one-half years later from metastasis.

Postoperative Stomach

For years Bockus has stressed the importance of a roentgen study of the postoperative stomach. This x-ray study should be done as soon as it is feasible after the patient has recovered from the surgical procedure. This study will then serve for comparison later if postoperative digestive complaints develop.

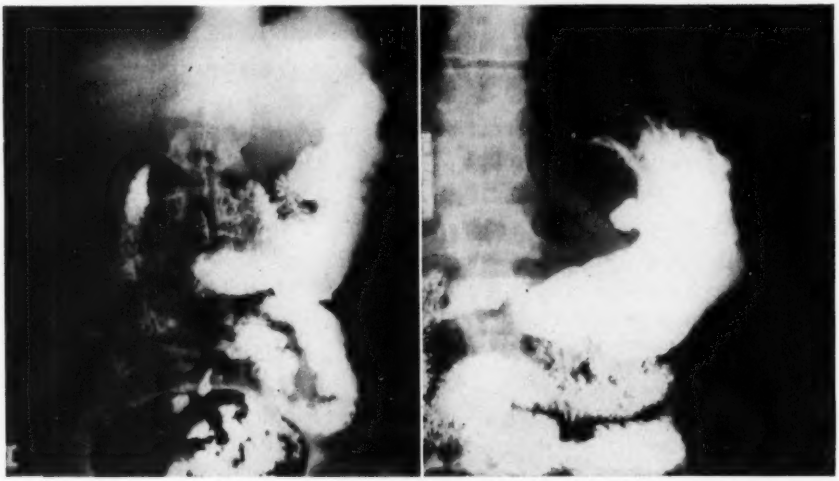

Fig. 7 Fig. 8

Figs. 7 and 8—Gastric ulcer penetrating and adherent to pancreas.

Esophagus

The esophagus should be studied carefully by fluoroscopy and roentgenograms. Thick and thin barium mixtures, the various positions employed standing and lying down and various maneuvers in the study are familiar to you. This slide reveals a lesion in the lower esophagus. This man had increasing difficulty in swallowing. Several roentgen studies were diagnosed as revealing functional trouble. Our studies revealed a filling defect which the esophageal biopsy proved to be carcinoma. A successful resection was done.

The next slide reveals a rare type of esophageal lesion, a leiomyoma. This was diagnosed by fluoroscopy, film studies and esophagoscopy. It was removed easily.

It is important that malignant lesions of the esophagus be recognized early because surgery has improved greatly in the removal of these growths. It is important to remember that esophagoscopy and biopsy are important in establishing the diagnosis.

A large esophageal hiatus hernia is readily seen when of this size (Fig. 6). A smaller hernia may escape detection unless special maneuvers like the Valsalva maneuver is employed in its demonstration.

Prolapse of Gastric Mucosa

Case 9:—This patient presented a filling defect in the distal stomach which prolapsed into the duodenal bulb. A diagnosis of hypertrophic gastric mucosa with prolapse into the duodenal bulb was made. The possibility of a prolapsing polyp could not be ruled out. At surgery the lesion was found to be hypertrophy of the mucosa with prolapse into the duodenum. The surgical result was good.

Gallbladder

Gallbladder x-ray is one of the most reliable medical diagnostic tests. Nonvisualization of the gallbladder is almost as accurate an index of disease as the demonstration of calculi. If no gallbladder shadow is seen after the usual dose of dye a second test with double the dose of dye should be done. Nonvisualization of the gallbladder after such a complete study means disease is present in over 95 per cent of patients usually with stones.

Conclusion

It is well to remember that lesions of the digestive tract are not infrequently multiple.

It is important to do a complete x-ray study and not to settle for a piecemeal examination. The patient may have an active duodenal ulcer or a gallbladder full of stones but the carcinoma of the colon may be the most serious and immediate problem.

The x-ray studies must be considered with the full clinical picture. A negative gastrointestinal x-ray study in the patient who is bleeding or jaundiced or losing weight may not be nearly as negative as it appears. As Sosman stated in a recent paper no x-ray machine yet developed furnishes a diagnosis with the film. Reliance on an x-ray examination should be placed not on the examination itself but on the ability and experience of the examiner.

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Discussion

Dr. I. Snapper:—Dr. Shaiken's paper has certainly underlined the diagnostic importance of roentgenologic examination for gastroenterology. Nevertheless, it is regrettable that many gastroenterologists stay as far away as possible from the patient and rely completely on x-ray examination. I am afraid that diagnostic errors are made by accentuating x-ray examination *too* much.

It is true that a roentgenologist with excellent technic can often visualize polyps in the colon. It is just as true that most polyps cannot be visualized. When a patient is operated for a polyp of the colon, usually the opening of the colon after hemicolectomy shows many more polyps than were shown on the x-ray. It is important that the roentgenologist cannot find all the polyps which are present in the colon. Therefore, if at sigmoidoscopy of a patient with bleeding by rectum, the blood can be seen to come from above and if the radiologist after many efforts says he can't find polyps, then the presence of polyps has not at all been excluded.

One should never exaggerate. Gastroenterology has not become a specialty only after the discoverey of roentgenology. Boas from Berlin raised gastroenterology to a specialty and at that time roentgenology had not been invented yet. Even today there is still an important part of gastroenterology where x-rays play only a small role.

The old clinicians thought that thanks to percussion and auscultation they could diagnose most diseases above the diaphragm. However, they were convinced that in diseases below the diaphragm they committed many errors. Our diagnostic abilities concerning the hollow abdominal organs have been greatly improved, thanks to Dr. Shaiken and his colleagues. However, roentgenologic examination does not give too much information about the pancreas. It is true that in cases of pancreatic stones, there is always pancreatitis, but these stones are found only in a small percentage of cases of pancreatitis. So far as tumors of the pancreas are concerned, apart from carcinoma of the head of the pancreas, the roentgen information is very scanty. Retroperitoneal tumors are of frequent occurrence and there radiology gives only rarely decisive information. Diseases of the liver form still an important part of gastroenterology and there, apart from gallstones, the x-ray evidence is practically zero. Acute appendicitis cannot be diagnosed by roentgenograms and this may be the reason that this diagnosis is nowadays missed more frequently than 30 years ago. The modern clinician has

no self-confidence to diagnose any disease when neither laboratory nor roentgenologic confirmation is available.

Gastroenterology is still more than x-ray examination of the abdominal organs; careful examinations, careful palpation, and careful evaluation of the different signs and symptoms still play an all-important role in many abdominal diseases and we may well have weakened the structure of gastroenterology by putting so much emphasis on laboratory evidence that we cannot diagnose diseases in which laboratory evidence is not yet available. This does not mean that I disagree with anything Dr. Shaiken has said. I wholeheartedly agree that roentgenology is of tremendous help for a correct diagnosis.

ANORECTAL FISTULA

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This subject has a confusing terminology, an equivocal pathogenesis and a surgical approach based on an inadequate concept of the anorectal musculature.

Terminology

As commonly used, the term anorectal fistula refers to pathological tracts extending completely or incompletely from the skin to the anal canal or rectum or vice-versa. When the tract is complete with a definite demonstrable relationship to the anorectal musculature, the terminology and pathogenesis are usually clear and the treatment successful. When incomplete, however, all of these factors may be equivocal. Tracts with openings only in the anal canal or rectum are referred to as blind internal fistulae, those with openings only in the skin as blind external fistulae. There is some confusion between the terms fistula and sinus. The latter may actually have been complete fistulae with healed internal openings not demonstrable by gross clinical methods.

Pathogenesis

This is not always readily understood. The common denominator in the pathogenesis is an antecedent infectious process, usually localized, but sometimes diffuse which usually originates in the anorectum. The precise site of the initial focus, its activation and its pathways of extension may however be sometimes quite obscure. "Cryptitis" has been much overemphasized in the etiology. The so-called primary or internal opening is usually considered the point of origin of the fistula and this is no doubt true in the common low anal variety in which infection reaches the perianal ducts and glands generally through the crypts. However, in the high anal or so-called anorectal fistula in which the internal opening is sometimes never found (about 25 per cent of the cases) the original focus may be entirely of extra-anal or extra-rectal origin. This is surgically significant.

In general, anorectal fistulae develop along one of three distinct pathogenic lines which are highly significant to the surgery.

1. The first and common pathogenesis is a local abscess involving the perianal space from an infectious focus reaching the pecten through the crypts, lymphatics or blood vessels. The perianal ducts and glands (intramuscular glands) are commonly considered as a site of predilection in this pathogenesis.

The resultant fistula usually involves all or part of the subcutaneous external sphincter muscle and has its internal or primary opening in or near the intermuscular groove or septum – the low level anal fistula. Occasionally the tract involves

no muscle – a submucus or subcutaneous fistula. The commoner anorectal conditions – hemorrhoids, fissure, anal ulcers, proctitis, stricture and local trauma of various kinds are significant etiologic factors in these simple fistulae.

2. Secondly, a less common but more ominous pathogenesis, is an infectious process which produces abscess in one of the deeper anorectal spaces–supralevator, retrorectal or ischiorectal, usually the latter, and results in fistulae which may or may not have internal or primary openings usually above the intersphincteric groove or septum, the high level or so-called anorectal fistulae. In about 25 per cent of these cases no internal opening is found before, during or after surgery. The pathogenesis, classification and treatment remain in doubt. In these fistulae the suspected routes of infection from the anal canal or terminal rectum are still equivocal. Many pathways have been considered, viz., the lymphatics (Reichle, 1941), the blood vessels (Hiller, 1931), the crypts (Courtney, 1947), the anal glands (Hermann and Desfosses, 1880 and Gordon, Watson and Dodds, 1933). The initial focus, however, may not have originated in the bowel and even though an anal or rectal opening is sometimes demonstrable, it does not necessarily follow that the antecedent abscess was of enteric origin. This concept may confuse the pathogenesis and the surgery with its high incidence of recurrence.

Extra-enteric foci from the deep urethra, prostate, seminal vesicles, adnexa, fetal rests, dermoids, bone or elsewhere may produce abscess in the perirectal spaces. The resulting deep fistulae or sinuses are usually complicated and their surgical approach must be based on the correct and precise relation of the main tract and its internal or primary opening, if found, to the *anorectal muscle ring*. About ⅔ of these fistulae are of the posterior horseshoe variety. Recurrence rates average about 20 per cent. It is not unlikely that the original focus of the inciting abscess persists and prevents complete healing of the operative wounds. In 40 cases of high level anal fistula reported by Morgan of St. Marks Hospital, London, no internal opening was demonstrable in 10 or 25 per cent. Only half the cases were "cured" by one operation.

3. Thirdly the anorectal fistulae are complications, and should be so considered, of chronic ulcerative colitis, 7 per cent, tuberculosis 5-10 per cent, regional ileitis and the granulomatous diseases. In these conditions mechanisms of tissue resistance and repair are profoundly influenced by biochemical, hormonic and allergenic factors not yet completely understood. This is highly significant to equivocal surgery. These fistulae will be discussed in a future communication.

Classification of Anorectal Fistula

The usual clinical classification of anorectal fistula, simple and complex, into complete and incomplete forms, etc., has had but little significance for the surgical anatomy of the anorectal musculature or the origin and pathological course of this disease.

Although not entirely satisfactory and not including fistulae which may have phasic or no internal openings at any time, the simplest classification is anatom-

ical and based on the relation of the main tract and its internal opening to readily defined palpable anorectal landmarks – namely the *intermuscular septum* and the *anorectal muscle* ring (Fig. 1), (not the anorectal line). These landmarks are highly significant to the relative conservation of anal continence – the important consideration in fistula surgery.

1. Anorectal Fistula not involving anorectal musculature.
   a. Subcutaneous 3 per cent
   b. Submucus 1 per cent

These also are loosely referred to as sinuses when incomplete.

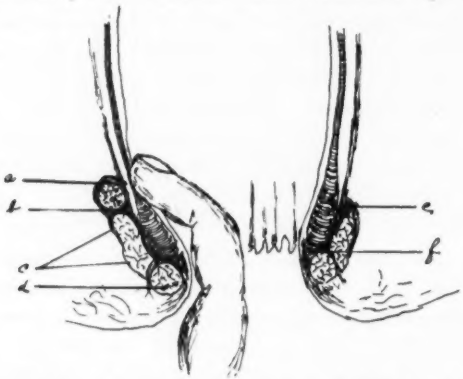

Fig. 1–Finger tip identifies the anorectal muscle ring posteriorly – the puborectalis sling. a. The upper level of the ring posteriorly. b. The junction and fusion of the profundus fibres of the external anal sphincter with the puborectalis fibres of the levator ani muscle. c. The profundus and superficialis fibres of the external anal sphincter muscle. e. The somewhat lower level of the anorectal muscle ring anteriorly. f. The anal intermuscular septum-groove, intersphincteric line, etc. d. The subcutaneous external sphincter.

2. Fistula involving anorectal musculature.
   a. Low anal–the common variety 75 to 85 per cent
   b. High anal 10 per cent
   c. Anorectal 5 per cent

(b) and (c) may have no internal openings demonstrable and may be sinuses.

Regardless of multiple external openings, secondary extensions in and around the perineum, to the vulva, scrotum, inguinal regions, etc., (anoperineal, anovulval, anoinguinal fistulae) the relation of the main tract and its internal opening to the anorectal muscle ring remains the basis for the classification and the surgery.

Diagnosis – General Considerations

There is usually a history of painful abscess with incisional drainage or spontaneous rupture externally or occasionally into the rectum followed by chronic

discharge. Rupture into the rectum is suggestive of an original deep abscess. Repeated abscess with intermittent drainage may have occurred. Purulent discharge from the rectum is suggestive of submucus tract or an internal sinus. Bleeding is uncommon and usually arises from an associated ulcer, fissure or internal hemorrhoids. Pruritus is usually not severe. Sensory disturbances and defecatory dysfunction with partial anal incontinence may be prominent in the recurrent fistula. They have ominous signs for additional surgery.

Systemic symptoms are usually only observed in virulent infection. Insidious onset suggests tuberculosis, chronic ulcerative colitis, regional ileitis or the granulomata. A history of a previous genitourinary infection, particularly gonorrhea, is highly suggestive of an extraenteric origin of the fistula. Traumatic injuries, gunshot wounds, impalements, etc., usually terminate in complicated fistulae or sinuses.

Inspection

One or more external openings are usually observed at varying distances from the anal verge. They may be healed-over or pinpoint in size and buried in the anal skin folds. The external opening of the main tract is commonly described as having a definite relation to the internal opening (Goodsall's Law). Tracts with openings posterior to the interischial line usually curve to a posterior internal opening in or near the midline; those with anterior openings usually have straight or radial tracts, the internal opening directly opposite the external.

Openings without scarring indicate spontaneous rupture; with scarring previous incisions. Scarring in the anal canal suggests previous unsuccessful surgery.

Palpation and Bidigital Examination

The main tract of a fistula is the residual unhealed and contracted cavity of the original abscess and its extensions. Secondary tracts are usually due to successive burrowing and abscess formation from the main tract. Histologically, the tracts are condensed connective tissue tubes lined with infected granulation tissue – pyogenic membrane.

Careful direct and bidigital palpation is very informative in determining the extent and direction of the main tract and disclosing its internal opening if present. Tracts of low anal fistulae are usually palpable as linear cord-like tubes running parallel to the skin surface and blending into the tissues of the pecten at the level of the intermuscular septum. In the high anal or anorectal fistulae, however, the tracts extend parallel to the rectal wall and usually well up into the ischiorectal space.

In the recurrent fistula the bony and ligamentous landmarks are apt to be partly obscured. In the posterior horseshoe fistula, the tract above the anococcygeal ligament (*raphe*) and its extension into the opposite ishiorectal space may

sometimes be palpable. Fixation of the posterior anorectal angle is highly suggestive of a deep tract.

Internal openings are usually palpated as tiny pitted ulcers with scarred rimmed edges, sometimes as small indurated nodules in or below the anoderm or the mucus membrane of the sphincteric rectum. Traction on the tract may be informative as to the level of the internal opening.

The exact relation of the main tract and its internal opening to the intermuscular septum and anorectal muscle ring is the *sine qua non* to successful surgery.

Commonly enough no internal opening is demonstrable. All too often its anticipated disclosure at operation fails despite extensive incisions, fruitless probings and injections. A false opening, if made, is commonly followed by recurrence and complicates subsequent examinations and further surgery.

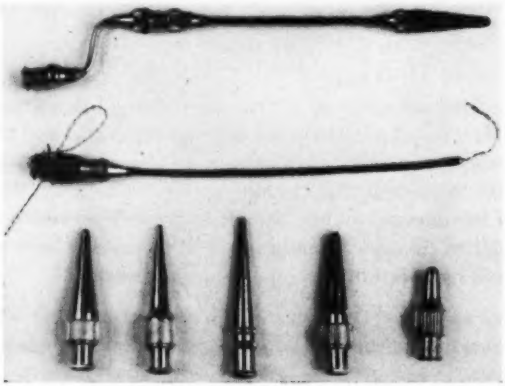

Fig. 2–Various sized fistula tips for injecting Topogesine. Canalized probe with seton wire.

The common practice of probing tracts to determine their completeness is often painful and provokes a spasm and retraction of the anal musculature which may preclude a satisfactory examination.

The following simple injection technic is recommend preceding any probing or digital examinations. With appropriate sized fistula tips (Fig. 2), the topical anesthetic Topogesine is gently injected into the fistulous tract. This anesthetizes the tract. If an internal opening is present, the patient usually complains of a burning sensation in the anal canal or lower rectum, which definitely establishes the fistula as complete. Bidigital examination is the next step, not probing. With the tip of the index finger at the suspected anal opening the Topogesine may often be felt as it "squirts" or runs into the anal canal. The exact location and level of the internal opening in relation to the anal musculature is thus definitely established.

Having demonstrated the completeness of the tract, a soft probe with fenestrated tip may often be passed through it into the anal canal. The probe is then threaded with #40 suture wire which is drawn out through the anal canal and remains in the tract as a temporary seton when the probe is withdrawn. This simple procedure positively identifies the internal opening for the surgery.

If no internal opening is demonstrable with Topogesine, which may be colored if desired with methylene blue or merthiolate, etc., a 20 per cent peroxide solution may be injected. However, the possibility of making false openings with a strong oxidizing agent should be appreciated. The same applies to injudicious probing.

Internal openings may also be demonstrated by the retrograde introduction of a "hooked" probe. They are usually in the depth of a crypt from which a purulent discharge may sometimes be expressed or they lie below the anoderm or in the folds of the submucus space. They are sometimes not so readily demonstrable as anticipated. False passages are possible. When no internal opening is found in the high level anal or anorectal fistula the advisability of surgery is equivocal. Repeated attempts should be made to establish it.

Fistulae may be advantageously studied stereoscopically after lipiodol or bismuth paste injections, particularly those with history of deep pelvorectal, retrorectal or suspected bone infections.

Differential Diagnosis

In the differential diagnosis sinuses and fistulae of microaerophilic infections, hydradinitis suppurativa, simple epidermal fistulae of the perineum and extensions from pilonidal disease may be confusing. Less commonly sinuses complicating deep tuberculous infections, lymphopathia venereum and regional ileitis are to be excluded.

Treatment — General Considerations

Recognition and evaluation of the entire pathogenesis may be of greater significance to the surgery than the clinical classification. The importance of gastrointestinal and genitourinary disorders in the pathogenesis and clinical course of anorectal fistulae is re-emphasized.

Prophylaxis

The prophylaxis of anorectal fistula has been a neglected and equivocal subject. Recent statistical reports, notably by Granet, Kreutzer and others, appear to justify a more radical surgical approach to the acute perianal abscess than is generally done. If the source of the infectious focus in the anal canal is eradicated or drained simultaneously with the incisional drainage of the acute abscess the incidence of subsequent fistulization is apparently materially reduced. This

procedure presupposes that the focus of the abscess is in the crypts, perianal ducts or glands and it entails at least complete division of the subcutaneous external sphincter muscle. Incision of anorectal musculature is mandatory to this procedure whether an internal opening is disclosed or one is made by blind puncture of the anoderm. It may be emphasized that this procedure may entail some risk of incontinence and recurrence in the high level anal and anorectal fistula. The cases of incontinence compiled by Blaisdell following simple incision of perianal abscesses in the hands of proctologists, supposedly familiar with the anorectal musculature are significant.

The so-called "stem-to-stern" drainage in the prophylaxis of anorectal fistulae is preferably applied only to the acute or subacute perianal space abscess – the precursor of the low level anal fistula. Spontaneous rupture of many perianal abscesses and the increasing symptomatic use of the antibiotics materially reduces the scope of this preventive procedure. The definitive treatment is surgical, either fistulotomy or fistulectomy with or without setonization of the anorectal musculature – the two stage procedure. Setonization may be useful in the high anal fistula with lateral internal opening; in anterior fistula in the female; in posterior fistula usually of the horseshoe variety with internal opening involving the anorectal muscle ring; and in the occasional rectal fistula. Wire is preferred for seton use.

As a rule, fistulectomy has no advantage over fistulotomy. In recurrent fistulae, however, in which the tracts are imbedded in excessive scar tissue, complete fistulectomy may avoid recurrence and postoperative bridging.

Fistulae with two internal openings may be treated in one operation, provided one of the internal openings or preferably the higher one is setonized. Two independent fistulae are treated in successive operations.

Anesthesia

A low spinal anesthesia with procaine 30 to 50 mg. through a 26 gauge needle, is the anesthetic preferred by the author for fistula surgery despite its "ironing-out" effect on the anal musculature. In extensive fistula, the complete relaxation afforded by spinal anesthesia favors sharp dissection and complete exposure.

Caudal and intravenous anesthesia are used as indicated.

Local infiltration anesthesia may fail to provide the necessary relaxation for complete exposure and dissection of the unsuspected ramifications of the main fistulous tract. An appreciable percentage of fistula recurrence is attributable to so-called "office proctology" with local anesthesia and incomplete surgery.

Fistula Not Involving Anorectal Musculature

1. *Subcutaneous Fistula* (*complete and incomplete*):—This simple variety may follow infected hematomata, superficial subcutaneous infections, bridging

and premature epithelization in neglected surgical wounds. The tracts are usually straight, complete, superficial with their internal opening below the anal intermuscular septum. The marginal and subcryptic abscess of gonorrheal and tuberculous origin are prone to subcutaneous fistulization or sinus formation. Simple subcutaneous burrowing from an abscess or infected crypts below the anoderm is not uncommon. Multiple subcutaneous fistula or sinus is that which is secondary to a chronic fissure-in-ano.

Treatment:—Since no muscle is involved in this fistula or sinus simple unroofing of the perianal skin and anoderm with adequate skin drainage usually suffices for cure. Extensions above the dentate (anorectal) line should be excluded. In selected cases complete excision with skin closure may be successful. When these fistulae or sinuses occur in the commissures particularly the posterior, external skin drainage should be adequate to prevent postoperative fissures. Complete division of the subcutaneous external sphincter muscle may be necessary to provide adequate drainage. Bridging and premature healing of the skin are the more important deterrents to sound closure.

Multiple subcutaneous fistulae, as in hydradenitis suppurativa or the microaerophilic infections, should be unroofed into a common wound which may be advantageously treated with zinc peroxide cream. Skin grafting in large wounds may shorten healing time.

2. *Submucus Fistula* (*Complete and incomplete*):—This is commonly a blind sinus involving the submucus space of the rectum. It may also involve the rectal wall. It usually has one opening in the intermuscular septum. It may, however, be complete with a secondary opening or openings higher up in the rectum. Occasionally extensions burrow through the anoderm and below the perianal skin. Lateral tracts are uncommon but may be troublesome. Submucus extensions are occasionally observed in the low and high anorectal fistula and if overlooked, are prone to initiate recurrence or persistent purulent discharge.

Treatment:—Good exposure and light are essential. Submucus tracts should be completely unroofed, preferably on a grooved director with the actual cautery. If overly vascular they may be incised between thin clamps or by successive ligature. The clamped tract may be transfixed. These methods are useful in lateral extensions which may involve the larger branches of the superior hemorrhoidal vessels. Postoperative sphincter spasm may be a deterrent to effective drainage in these cases and sphincterotomy of the subcutaneous muscle may be necessary. The rectal wounds may be temporarily packed with iodoform gauze or hemostatic cotton.

Periodic inspection through an anoscope — which is painful — to assure unbridged healing, is the more important postoperative indication.

Fistulae or Sinuses Involving Anorectal Musculature at or Below The Intermuscular Septum

1. *Complete low level anal fistula* (*Fig. 3a*):—About 75 per cent of anorectal fistulae are of the low level anal variety. The comparatively higher incidence is primarily due to the predisposing pathoanatomy e.g. the perianal ducts, glands, the crypts and the transitional neurovascular supply. The initiating focus of these fistulae usually arises in the pecten. Their main tracts extend through the intermuscular septum or the subcutaneous sphincter muscle and their primary or internal openings are commonly at this low anal level. They usually extend parallel to the skin which is a diagnostic feature and indicates that the pathogenic abscess was confined to the perianal space. There may be two or more external openings usually on the same side. Openings on the opposite side indicate subcutaneous burrowing or bilateral fistulae which are rare. Usually all tracts communicate with one main tract and one internal opening. The relative locations of the internal and external openings usually correspond to Goodsall's law. Occasionally the main tract is incomplete at either end, blind internal or external.

Bacterial invasion of the perianal tissues through the crypts is undoubtedly the usual and initial stage in this common variety of anal fistula and offers an explanation for the intermuscular septum as being the common site for the internal opening. What is not so readily explained, however, is the common posterior location of the internal opening in about 80 per cent of cases. Careful anatomical dissections show that the larger branches of the inferior hemorrhoidal vessels reach the intermuscular septum just lateral to the posterior commissure and these may be significant in the etiology. The larger crypts are also observed in this posterior location which additionally is subject to the most trauma in defecation. It may, however, be noted that these anatomical and physiological factors are present throughout the early decades in which anal abscess and fistula are comparatively uncommon.

Treatment:—With a complete tract and a definite relation established to the intermuscular septum and anorectal muscle ring, the surgical indications in this simple fistula are usually definite. These include complete incision of the main tract with all or part of the subcutaneous external sphincter muscle and complete eradication of the perianal ducts or glands — the so-called "cryptic focus" in the pecten tissues at the site of the primary or internal opening. The pecten tissues in the same anal quadrant as the internal opening should be drained, anal quadrant drainage. Submucus extensions are to be excluded and if found, unroofed and continued into the fistulous wound. It makes little difference in this variety of fistula whether the main tract is incised from within outwards or vice versa. Although division of the subcutaneous external sphincter has but little effect on sphincter control it is preferable when possible to incise the muscle at right angles to its long axis. This minimizes subsequent postoperative sensory disturbances. Skin wounds are preferably extended beyond the external opening

of the fistula — Salmon's back cut — to avoid premature healing of the external wound. Packing of wounds for more than 48 hours should be avoided. In the postoperative care, measures to minimize sphincter spasm and maintain physiological drainage are of more importance than so-called granulation tissue stimulants.

2. *Incomplete Low Level Anal Fistula:*—a. Incomplete internally (blind internal fistula).

The failure to disclose an internal opening in this fistula is not always clear. It may be due to poor diagnostic methods. Careful palpation and traction on the tract usually indicates that the pecten tissues were at one time involved in the inflammatory process. When no internal opening is demonstrable from either within or without the anal canal, the following procedure should be carried out. The tract should be *excised* from without up to its blind end which is usually at the anal musculature. Traction on the tract will usually indicate the site of the original primary opening in the pecten tissues, now healed in. It is inadvisable to excise this variety of fistula from within outwards. Complete excision of

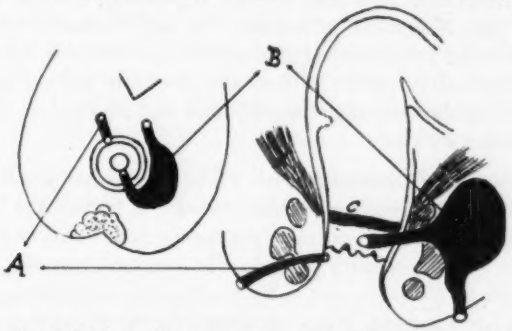

Fig. 3—A. Low level anal fistula — the common type. Internal opening in the anal intermuscular septum. B. The high anal type — internal opening above the intramuscular septum but usually below the anorectal muscle ring C.

the suspected crypts, the scar tissue and the pecten tissues in the involved anal quadrant with division of the subcutaneous external sphincter muscle will usually result in a successful result. This equivocal procedure however should not be used in the high level or anorectal fistula.

b. Incomplete externally (blind internal fistula).

In this variety of fistula the abscess has usually drained back into the anal canal through the site of the original anal focus. The terminology implies that an internal opening is present, and usually readily demonstrated. The tract in this fistula should be retrograded through the musculature until the tip of the probe becomes palpable below the skin. An external skin incision completes the tract and the same surgical details described under the complete variety of fistulae are carried out.

3. *High Level Anal Fistula (Fig. 3b):*—About 8 per cent of anorectal fistulae are of this type. With the highest rates of morbidity, recurrence and incontinence it sometimes presents a difficult problem for ultimate cure. The main tract of this fistula usually extends upward parallel to the rectal wall into the ischiorectal space – a significant diagnostic feature – and enters the upper anal canal usually, posteriorly, below the anorectal muscle ring (Puborectalis sling). No internal opening is demonstrable in about 20 per cent of these fistulae. Extensions from the main tract usually burrow behind the anal canal and form the so-called posterior horse-shoe fistula in about ⅔ of the cases. These require separate consideration. The internal opening, however, may be found in any quadrant and complex patterns of the tracts are occasionally observed.

Pathogenesis:—The antecedent abscess in these fistulae is usually of the ischiorectal space variety but its site of origin and routes of infection to or from the anal canal are, as already noted, highly equivocal. Occasionally supralevator or retrorectal abscesses following trauma, impalements, fractures and gunshot wounds eventuate in high level anal fistulae. Abscesses following episiotomy and perineorrhaphy may also result in fistulae with high anterior openings and present a special problem in preserving anal continence. Internal openings following spontaneous or operative rupture of deep abscesses into the rectum or anal canal may prove to be highly confusing complications and obscure the true pathogenic focus of the ensuing fistulae.

Treatment—General Considerations:—There are several problems in the therapy of high fistulae. The chief one is the difficulty in finding the true pathogenic internal opening which is not found as previously noted in about 20 per cent of the cases before, during or after surgery. The internal opening may be permanently or temporarily closed by dense fibrous tissue; a connection with the bowel may never have been present. When not found the result becomes equivocal and the extensive guttering of the wounds followed by a protracted convalescence in the hope that the primary focus may heal is useless in about 50 per cent of the cases. We are decidedly opposed to blind puncture of the sphincter musculature at a suspected site of the internal opening.

It may be useful to point out that the residual induration and scarring which usually extends along the pubococcygeal and puborectalis muscles at the level of the anorectal muscle ring greatly increases the difficulties in finding the internal opening of this fistula. Short side tracts are commonly present and should not be confused with the main tract. Recurrence may then follow. Preoperative setonization of the main tract when this is possible greatly facilitates the surgery.

When and if the primary opening is found, its exact position and relation to the anorectal muscle ring must be determined and a choice must be made between complete incision of the involved musculature or stage procedures, e.g., setonization of the musculature or its temporary suture. The dissection of the tracts should therefore start externally rather than internally as sometimes advised. All tracts

should be meticulously followed to their termination by direct inspection and palpation with successive gentle introduction of the probe and unroofing of the tissue above it. Recognition of a pyogenic membrane and infected granulation tissue is the guide to the continuation of the tracts, and the ultimate disclosure of the internal opening if one is present. The injection of dyes to delineate the tracts is an equivocal procedure. It may be confusing rather than helpful. Dissection of the tracts along the bowel wall should be guided by finger control in the rectum. This is very important.

Of particular importance to future continence of the anal canal is the location of the internal opening. Anterior and lateral fistulae, particularly in the female, entail the greater risk and these are preferably setonized. Lateral openings may require wide posterior guttering and lateral saucerization of the wounds.

Essential to ultimate sound healing in deep fistulae is the flattening out or saucerization of the wound. Because of the anatomical restrictions of the perineum adequate saucerization must usually be secured by a long posterior extension of the wound with deep guttering throughout the ischiorectal space. This may require excision of the coccyx or lower sacrum and incisions through the gluteus muscle. Recurrence stems perhaps just as often from faulty wound architecture with inadequate and obstructive drainage as from a failure to ferret out the internal opening, when one is present.

Posterior Horseshoe Fistula:—This is the common pattern of the high level anal fistula. The location of its internal opening and main tract has some bearing on its treatment.

If the primary opening, which is usually of the high anal variety, is lateral or anterior, the lateral tracts on either side are incised and the incisions carried posteriorly to the lateral margins of the anococcygeal ligament which is left intact. The posterior communicating tract is thoroughly curetted and a drain passed through it to either side. The main lateral or anterior tract with the intervening anal musculature may be completely divided. However, it is preferable to setonize the musculature and subsequently incise it in stages.

The internal opening of these horseshoe fistulae are usually at or near the posterior midline in which case the following procedure appears preferable.

The lateral incisions are made as described above but the communicating tract is setonized with soft #40 suture wire while healing of the lateral tracts continues to a well advanced stage.

The communicating tract, the main tract and the anal musculature are then incised and guttered into a large single posterior wound. Additional skin drainage is usually necessary. It may be observed that the level of the internal opening in the anal canal may not be on the same level as the deepest portion of the posterior communicating tract. This is very important.

Finally a one-stage procedure may be done by dividing the main tract, the anal musculature as well as the lateral and posterior communicating tracts, all saucerized into one large wound. This entails considerable gaping of the tissues which is usually followed by some deformity as well as partial anal incontinence, particularly if the main tract is lateral or anterior. It is however the surest method.

Anterior horseshoe fistulae are treated in a similar manner. Due consideration however, must be given to the greater risks for anal incontince because of the comparatively smaller anorectal muscle ring, particularly in the female. In addition to the use of muscle setonization, it may be advantageous to temporarily maintain approximation of the severed ends of the anal sphincters with wire lock stitches which are removed when the wounds become firm and less apt to gape. Operative wounds are usually packed with iodoform gauze strips. Hemostatic gauze has been largely discarded by the author. Gauze should be removed within 48 hours; further packing in the musculature should be avoided.

The essential after-care of the wounds is to assure non-obstructive drainage by the immediate destruction of undermined skin, mucus membrane pocketing or bridging of the granulations. Soft spongy indolent granulations should be curetted. Excessive purulent wound discharge is suggestive of unsound healing. Maintaining an adequate physical and physiological environment for cellular growth is of more importance than the use and abuse of so-called granulation or epithelial stimulants. Wounds which fail to respond to ordinary care should be studied bacteriologically (followed by specific therapy). Unsuspected microaerophilic organisms, and fungi are common deterrents to sound healing. Zinc peroxide dressings are useful in these cases. Blood transfusions, chemotherapy, high protein, ascorbic acid and calcium intake are sometimes useful adjuncts to promote healing.

The external portion of the wound should be kept on the same level as the anal portion. When the wire seton is used it must be "seesawed" successfully through the anal musculature to maintain this relation.

Anorectal Fistulae (Fig. 4):—About 5 per cent of anorectal fistulae are included under the term "anorectal" which was introduced by Milligan and Morgan in 1934. In general this terminology, somewhat ambiguous, refers to high level fistulae which have main tracts extending above the anorectal muscle ring with or without internal openings into the rectum. It also includes fistulae which have their main tracts entering the anal canal below the anorectal ring but with secondary extensions above it. As in the entire subject of anorectal fistula the basis for a clearly defined terminology and classification is lacking. To avoid confusion, the term "anolevator" might preferably be used.

Pathogenesis:—The pathogenesis of the suppurative processes resulting in these atypical fistulae is usually obscure. In the rare fistula with tract above the

anorectal ring and with demonstrable rectal opening traumatic perforation of the rectum or spontaneous rupture of a deep abscess into it should be suspected.

Extrarectal foci significant in the pathogenesis of these fistulae particularly those without internal openings are infections from the deep urethra, prostate, vesicles, adnexa, fetal rests and rarely from regional ileitis, the mycoses and tuberculosis.

Treatment:—The surgical principles as described under the high level anal fistulae are in like measure applicable to the anorectal or anolevator variety. Rarely the depth of the tracts preclude adequate saucerization and the fistula may be

Fig. 4—Anorectal fistulae.

A. The main tract extends above the anorectal muscle ring, usually parallel to the rectal wall — a diagnostic feature. B, C, D, represent levels of the internal openings, B is the commonest in which the tract follows the lower border of the puborectalis muscle and enters the rectum or upper anal canal in or near the posterior commisure. AR. Anorectal muscle ring.
In about 50 per cent of these fistulae *No Internal Opening* is demonstrable.

inoperable or equivocally so. Despite extensive drainage and careful after-care these fistulae have unduly high rates of recurrence with varying degrees of anal incontinence.

Fistulae of the anorectal or anolevator variety complicating chronic ulcerative colitis, regional ileitis and tuberculosis are usually inoperable.

Complications:—Incontinence, partial or complete is an occasional complication. In the complex or complicated fistula it may be unavoidable and should be anticipated. In general, satisfactory continence is retained if the *anorectal muscle ring* is left intact. It may be noted that this muscle ring in both sexes is compara-

tively smaller and its functional integration with the anal sphincters is much less complete anteriorly than posteriorly. Adequate knowledge of the several strata of the anorectal musculature and their relative functional importance in anal continence is essential to successful fistula surgery.

In the operative technic the following appear to be useful in preserving the maximum continence, incising the musculature at right angles to its fibres, avoidance of excessive and repeated packings between the sphincter ends and nonobstructive clean drainage.

In our experience wire setonization of the musculature or temporary approximation of the muscle ends with wire lock sutures have been helpful particularly in the complicated fistulae requiring wide external drainage incisons. The surgical

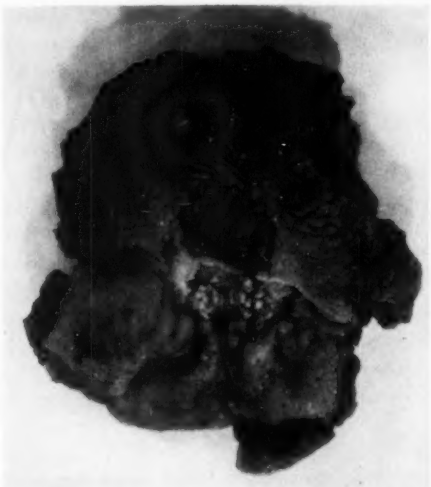

Fig. 5—Epithelioma arising in a previously operated fistula.

principles relative to the repair of the incontinent anal sphincter have been well described by Blaisdell.

Prolapse:—Partial or complete mucosal or hemorrhoidal prolapse may be an operative complication. Unless distinctly interfering with drainage, it is preferably disregarded and subsequently corrected by simple excision or injection as indicated.

Hemorrhage:—Proper exposure of the vessels in the operative technic and their transfixion usually obviates postoperative bleeding. The more troublesome bleeding arises from the vessels in the rectal wall.

Delayed or Incomplete Healing:—This may be an intractable late complication. The exact cause is not readily determined. It requires study from several angles. The physical conformation of the wounds, nonretractability, overlooked

tracts, chronic proctocolitis, infections with microphilic or other necrotizing organisms, fungi, viruses and an underlying systemic or metabolic disease may be significant.

A remote complication is a malignant degeneration which may occur in the pyogenic membrane of the fistulous tract or occasionally in the prolapsed and chronically irritated rectal mucus membrane following partial or complete incontinence (Fig. 5).

Recurrence:—Recurrent fistulae are of special interest and a challenge to the most experienced surgeon. Predisposing systemic or extraenteric causes may be overlooked – tuberculosis, coloproctitis and the granulomata. Cicatricial tissue materially increases the difficulty of finding the primary opening in subsequent operations albeit if one was ever present. This applies in particular to the high level anal fistulae in which the pathogenesis is usually equivocal from the outset, and in which the recurrent rate is about 20 per cent. The incidence in the recurrent fistulae is probably higher.

The precise reason for recurrence in a particular fistula is often obscure. A variety of reasons for recurrence have been advanced. These include misconceptions as to the pathogenesis, inadequate knowledge of the anorectal musculature with inadequate surgery, failure to find the internal opening when one is present, blind puncture of the anal canal or rectum, inadequate wound saucerization with obstructive postoperative drainage and missed bridging.

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MESENTERIC VASCULAR OCCLUSION

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Among the rarities encountered in gastrointestinal diseases is mesenteric vascular occlusion. In 1944 a review of the literature unfolded only 554 authentic cases of mesenteric thrombosis. Of this number only 32 successful surgical resections of the involved intestinal segments were reported[1]. Up to December 1, 1951 the total number of cases reported were 604 with 42 successful resections. To this number I wish to add two more cases with one successful resection (see Table I).

Case 1:—A 39 year old fireman was admitted to the hospital as an emergency patient. His story was that while lifting a hose he experienced sudden severe abdominal pain. This was followed by nausea and slight vomiting. He was rushed to the hospital where the diagnosis of shock plus intestinal obstruction was made. Examination at this time revealed a mitral systolic murmur. The most significant findings were pertinent to the abdomen. Soft abdominal distention was present, with moderate tenderness throughout all quadrants. There was no blood passed by rectum and none on the examining finger. The W.B.C. was 19,500 with 92 per cent polys. At a later date a history of rheumatic fever was obtained.

The patient was subjected to operation. The entire small bowel was gangrenous due to superior mesenteric artery thrombosis. A massive resection was performed with a subsequent anastomosis of the jejunum to the terminal ileum. The patient expired on the 4th postoperative day.

Case 2:—A 61 year old man, M.W.E., entered the hospital (5/1/51) because of sudden acute abdominal pain with nausea but no vomiting. Abdominal examination demonstrated soft distention with moderate tenderness in both lower quadrants. The W.B.C. was 17, 800 with 95 per cent polys.

After adequate preoperative blood transfusion, etc., to combat shock, he was subjected to surgery. Gangrenous small bowel secondary to mesenteric thrombosis was found. A massive resection was imperative. All of the small intestine except two feet of the jejunum and four inches of the ileum was removed. An end-to-end anastomosis of these segments was performed. His postoperative course was complicated by urinary retention which was treated satisfactorily by the urological service. A gastrointestinal barium study one month following operation was performed. The most interesting of these films are reproduced here.

The presentation of the above two cases illustrates the usual pattern in cases of mesenteric thrombosis. In addition it recalls to mind the extremely high mor-

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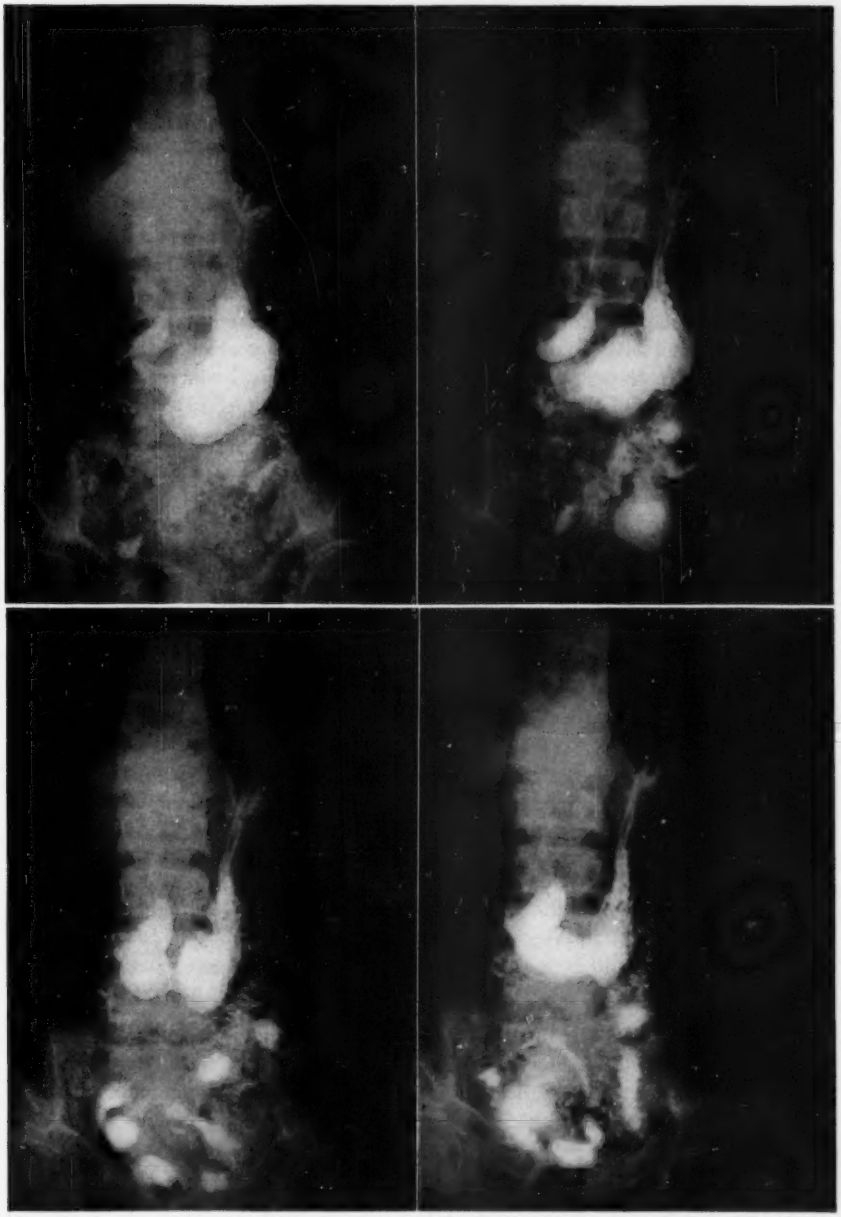

Fig. 1–Case 2. Postoperative barium studies taken at 5 minutes (upper left); 15 minutes (upper right); 30 minutes (lower left) and 45 minutes intervals (lower right) showing rapid passing of barium from stomach to colon.

tality associated with the disease. To date, including the two cases presented here, it appears that in 606 cases only 43 patients have survived intestinal resection. In order to diminish the mortality one author has suggested the procedure of embolectomy if the pathology site can be found in the mesenteric vessels[5]. The author performed this procedure on one patient who died following operation.

Etiology and Pathogenesis

Many authors have attempted to explain mesenteric vascular occlusion. Most of these investigators have divided their cases into the arterial and venous type.

More significant than the frequency of location is the manner of its occurrence. Embolism of the superior mesenteric artery may occur in patients with heart disease. In these cases the embolus arises from valvular vegetations and lodges in a branch of the superior mesenteric artery.

TABLE I

Year	Author	Cases Reviewed in Literature by Author	New Cases Reported by Author	Successful Resected Cases Reported in Literature	New Cases Successfully Resected Reported by Author
1944	Ficarra	554	15	32	3
1948	McClenahan	561	40	35	5
1950	Christenson	—	1		1
1950	Meyer	—	1		1
1951	Klass	—	1		(Embolectomy)
1951	Ficarra	604	2	42	1

When arterial thrombosis occurs, it may be attributed to atheromatous degeneration of the vessel wall.

The superior mesenteric artery is more frequently concerned, especially in embolism, than is the inferior mesenteric artery. The reason offered is its earlier exit from the aorta and because of its more direct continuation from the abdominal aorta.

Venous thrombosis of the mesenteric vessels is usually associated with infection in organs or viscera that are tributaries to the portal vein. The conditions usually antedating the thrombosis are appendicitis, pelvic inflammatory disease, diverticulitis, ulcerative colitis, or colonic neoplasm. Primary venous thrombosis is extremely rare.

The pathological condition resulting from vascular occlusion is infarction. It usually involves the lower part of the jejunum and the ileum. As a general statement it may be stated that the predominating cause of mesenteric occlusion

in younger patients is found to be heart disease or infection. In older patients the degenerative or chronic diseases appear to be important etiological agents.

Summary and Conclusions

1. A review of the literature and some thoughts on mesenteric vascular occlusion are presented.

2. Two cases are added to those previously reported.

3. Emphasis is placed upon the high mortality in this disease. Mortality is due to shock, loss of blood and fluids, and peritonitis.

4. No pathognomonic findings can be stressed. Sudden onset of acute abdominal pain with shock (pain is out of proportion to the physical findings) should suggest this disease entity.

5. Abdominal findings are: variable degrees of tenderness, moderate rigidity, often soft distention, and absence of peristalsis.

6. Clinical fallacies are the need for cardiac irregularities and blood passed per rectum.

7. Conservative therapy at present is not the accepted therapy. Surgical resection is the treatment of choice. Embolectomy has been suggested.

8. Treatment fails in those patients in whom superior mesenteric artery occlusion produces gangrene of the entire small intestine. Treatment is of no avail in those cases in which the patient's general condition is so desperate (due to shock, heart disease, toxemia, or liver damage) that any operative procedure cannot be contemplated.

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THE TREATMENT OF DIARRHEAL SYNDROME WITH RESION

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The realization that the diarrheal syndrome presents a public health as well as a medical problem has no doubt intensified the search by the physician for a treatment which would result in quick relief of the symptoms, namely, nausea, vomiting, abdominal pains and frequency of bowel evacuations.

Increasing medical knowledge teamed with pharmacologic research has outmoded the castor oil-paregoric regimen. A plethora of treatments have been suggested and tried without reaching a satisfactory solution to the problem. Recently, Resion*, a multiple intestinal adsorbent containing polyamine methylene resin, sodium aluminum silicate, and magnesium aluminum silicate in a palatable vehicle was introduced and may prove to be the medication which the physicians have been seeking.

Reports on Resion show it to have the capacity to remove toxic amines[1], to adsorb bacterial metabolites and even bacteria themselves[2], and to remove agents comparable to shellfish poisons[3], without interfering with essential food factors such as vitamins, minerals and amino acids.

Clinical evidence to support the effectiveness of Resion in the treatment of diarrhea in pediatric practice has been submitted by Joslin[4] and Quintos[5]. One hundred per cent effectiveness in the treatment of food poisoning was reported by Lichtman[6]. According to Fitzpatrick et al[7], "Resion, a multiple adsorbent combination, is an important addition to the physician's armamentarium for the treatment of nausea and vomiting of pregnancy."

A series of 50 patients representing all age groups from infancy to eighty-two years was placed on Resion therapy. A majority of these patients had numerous stool movements for three to five days prior to presenting themselves for medical advice, having failed to control their symptoms with the usual treatments such as kaolin-pectin preparations, bismuth preparations, aluminum preparations and paregoric. The patients for the most part had no organic disease, except for two who were in the terminal stages of bronchogenic carcinoma.

After a careful history survey and a thorough physical examination to rule out organic disease, Resion was prescribed in doses of two tablespoons stat., then

*Resion: A product of The National Drug Company, Philadelphia 44, Pennsylvania.

one tablespoonful after each bowel movement, or at least four times daily. For the younger group, the dose was made proportionately lower. Although the preparation was palatable, greater patient acceptance was obtained by having the Resion kept under refrigeration.

Following the first dose of Resion (two tablespoonsful) diarrhea, griping, nausea, flatulence and vomiting lessened appreciably, and within twenty-four hours had almost totally disappeared. Even in the two patients with bronchogenic carcinoma, the diarrheal symptoms were relieved in twenty-four hours. Two patients found it necessary to continue the treatment schedule for two days before definite improvement was established. Although marked improvement occurred after the first or second doses in a majority of the patients, Resion treatment was continued for at least three days. The therapeutic effects of Resion on the diarrheal syndrome in this series of patients were most gratifying to the patients and established Resion as the treatment of choice for future diarrhea cases.

Comment:—In this series of fifty cases with diarrheal syndrome, the etiologic factors were probably epidemic "virus enteritis", staphylococcus infection and diet. We did not deem it necessary to do any stool studies because of the rapid response to Resion treatment. The majority of these patients showed no significant constitutional involvement other than that of the alimentary tract. Had any of the cases persisted with the diarrhea for more than seventy-two hours after seeking our medical advice, every effort would have been made to establish the specific etiologic factor.

This study represents a working physician's clinical experience with Resion, a multiple adsorbent combination containing polyamine methylene resin, sodium aluminum silicate, and magnesium aluminum silicate in a palatable vehicle. While no significant statistical analysis can be obtained, it is suggested that Resion is the treatment of choice for diarrheas of the type the physician is called upon to treat in his everyday practice.

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EDITORIAL

Auscultation of the Esophagus

In esophageal diagnosis, auscultation may elicit symptoms which will give the examiner a clue to possible pathology of that organ. About a century ago this method of diagnosis was an important part of the physical diagnosis.

Even before the advent of the roentgen rays and the esophagoscope, clinicians noted that the sounds produced by swallowed liquids in their course down the esophagus, through the cardia, and into the stomach were changed by various types and degrees of obstructive lesions.

The description and classification of these sounds were similar to the classification of murmurs of the heart and served as a useful method of study.

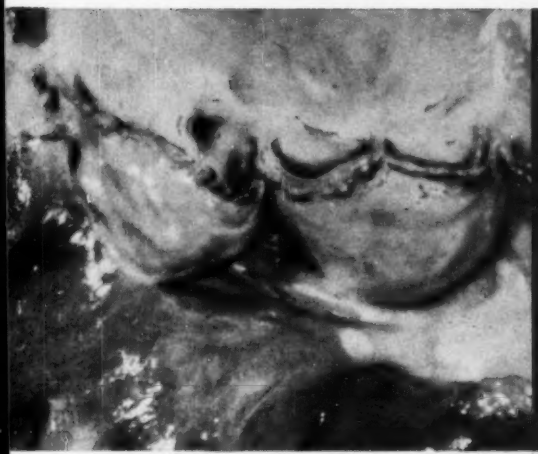
Globus hystericus was associated with esophageal spasm rather than a constriction of the muscles of the throat. In 1833, Hanay described cardiospasm, and in 1882, Mikulicz viewed the interior of the esophagus endoscopically and described the findings in cardiospasm and its association with dilatation, whereas in functional states, with similar symptoms, no dilatation or other abnormality could be visualized.

In neurotic patients, functional spasm was a primary finding and occurred usually in emotional states. While cardiospasm (achalasia) was found in stoical, placid people, and was a constant and progressive condition without regard to emotional states.

It may be evident from the history that organs remote from the esophagus may also cause spasms, belching, dyspnea. Duodenal ulcer, biliary tract disease and colitis should be ruled out before the patient is dismissed with a diagnosis of neurosis.

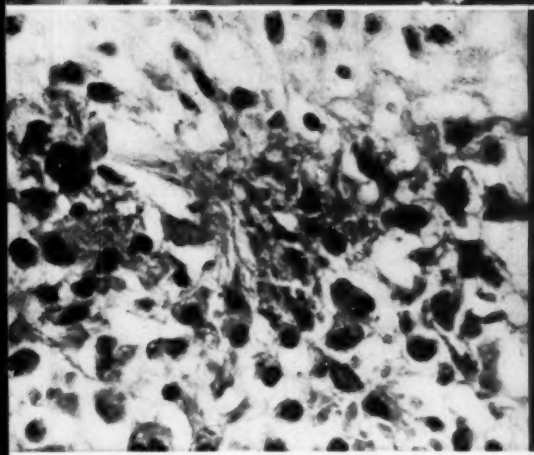
Samuel Weiss

response in rheumatic fever



q. Does cortisone influence the heart lesions of rheumatic fever?

a. Early cortisone administration suppresses and in some cases may even prevent serious cardiac damage.



q. What effect does cortisone have on acute rheumatic fever?

a. Often within 24 hours after cortisone therapy, the severely ill, toxic patient appears alert and comfortable; and within one to four days, temperature drops to normal, appetite increases, and polyarthritis subsides.

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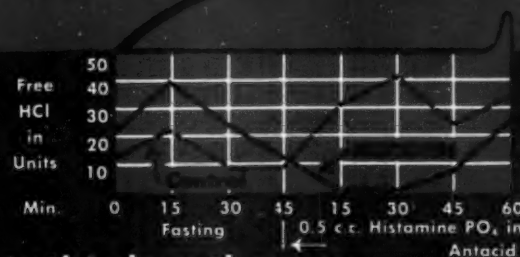

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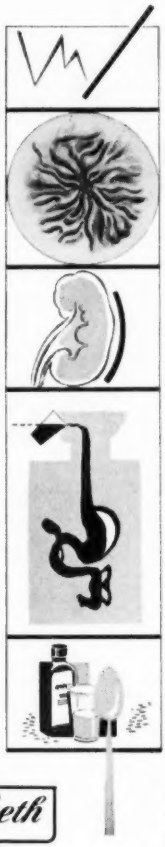

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